1509/818.

A TREATISE ON FOREST-TREES:

CONTAINING,

Not only the beſt Methods of their CULTURE hitherto practiſed, but a Variety of new and uſeful DISCOVERIES, the reſult of many repeated Experiments:

AS ALSO,

PLAIN DIRECTIONS for removing moſt of the valuable Kinds of FOREST-TREES, to the Height of Thirty Feet and upwards, with certain Succeſs;

AND,

On the ſame Principles, (with equal Succeſs) for tranſplanting HEDGES of ſundry Kinds, which will at once reſiſt Cattle:

TO WHICH ARE ADDED,

DIRECTIONS for the Diſpoſition, Planting, and Culture of HEDGES, by obſerving which, they will be handſomer and ſtronger Fences in five Years, than they now uſually are in ten.

By WILLIAM BOUTCHER, NURSERYMAN,
At COMELY-GARDEN, EDINBURGH.

Who then ſhall grace, or who improve the ſoil?
Who plants like BATHURST, *or who builds like* BOYLE.
'Tis uſe alone that ſanctifies expence,
And ſplendor borrows all her rays from ſenſe. POPE.

DUBLIN:
Printed for WILLIAM WILSON, No. 6, and JOHN EXSHAW, No. 86, Dame-ſtreet. MDCCLXXVI.

BRITISH MUSEUM
15 SEP 62

ADVERTISEMENT.

THE Editors of this Work, flatter themſelves, that it will be favourably received in Ireland, when they conſider,

Firſt, The uncommon number of Noblemen, Gentlemen, Gardeners, &c. who ſubſcribed to the Engliſh Edition of it.

Secondly, That, (as it conſiſts of experiments actually made in a climate leſs propitious to vegetation than this, by a man of character, both for honeſty and ſkill); it therefore is more to be relied on, than the uſual ſpeculative productions of mere Theoriſts.

And *Laſtly*, That the inclination of the Nobility and Gentry in this kingdom for improvements in Agriculture, has for theſe latter years conſiderably encreaſed.

DUBLIN.

BRITISH MUSEUM
15 SEP 62

PREFACE.

THE number of Pieces that have appeared on Gardening and Planting, and many of them by men of learning and obſervation, are ſo numerous, as to render it almoſt unneceſſary, and even preſumptuous, to offer any thing new to the public on either one or other of the ſubjects: But the Author of the following ſheets flatters himſelf, that, on an attentive peruſal of the ſubject he has particularly treated, theſe impreſſions will be removed; as the ſyſtem is far from being exhauſted; and as the rules hitherto directed are here extended and improved; with ſo many new obſervations, as to render a very conſiderable part of the work an original performance.

To relate the many pleaſures and advantages that attend the ſkilful practice of Gardening in all its different branches, but particularly in that no leſs noble than profitable one of Planting, would ill become my humble talents, from the high encomiums beſtowed on it by the greateſt antient and modern writers. It is ſufficient for me to ſay, it has been the favourite ſtudy and amuſement of the greateſt philoſophers, lawgivers, and men eminently attached to the improvement of their country, as well as thoſe who have retired from the buſy world to the tranquil ſtate of a rural life, filling up time with the virtuous and innocent employment of planting, and other country entertainments; or the more extenſive deſigns of laying out of ground in the modern taſte, or extending to it rides for proſpect and pleaſure, ſo ſtrikingly marked by that rural deity the late Mr. Shenſtone, in his rural elegance.

And ſure there ſeem, of human kind,
Some born to ſhun the ſolemn ſtrife;
Some for amuſive taſks deſign'd,
To ſoothe the certain ills of life;
Grace its lone vales with many a budding roſe,
New founts of bliſs diſcloſe,
Call forth refreſhing ſhades, and decorate repoſe.

No Piece can be more improving or give greater aſſiſtance in this way, than what the late Mr. Wheatly has obliged the world with in his two Pieces, an Eſſay on Deſign in Gardening, and his Obſervations on Modern Gardening, having adapted his directions ſuitable to the form of the ground, whether plain, or advantageouſly formed with riſing ſwells, or partaking of both, not neglecting to guide the

purling

BRITISH MUSEUM 15 SEP 62

purling ſtream, or how to manage the rougher grounds.

The Books hitherto publiſhed on the culture of Foreſt Trees, have done little more than vary the directions for a practice that has unhappily prevailed amongſt the greater number of inexperienced planters, whoſe views extended no farther than to ſet the young tree in the ground, which as ſoon as they had accompliſhed, ſuppoſed their labour and attention was to reſt there. They with the higheſt juſtice may be compared to thoſe unnatural parents, who neglect to tend and foſter their infant offspring, ſince from experience we find, that the vegetative tribe, as well as the animate, require both food and attention to rear them to ſtrength, maturity, and good order. The authors alluded to extend their directions no farther than ſowing the ſeed, planting the cuttings, or laying down the branches from the mother tree, in their proper ſeaſons, there to remain for a certain time, and from thence to be tranſplanted to the nurſery, there to be kept for three or four years, and then moved to the places where they are meant to remain for good; and here the buſineſs according to their directions is to end. What is now offered to the public is much more extenſive, containing directions not only to propagate the plants in a variety of ways, but the culture their different ages require, both for increaſing them in ſize as well as to form the beauty of their figure, giving the moſt pleaſurable hopes when tranſplanted, whether to ornament the pleaſure ground, the park, or the more extended improvements; collected from practice and obſervation, as well in Great Britain as in my native country; my practice has been ſtudiouſly bent to eſtabliſh certain methods for the removal of trees to the height of *thirty feet* or upwards, and with no leſs ſucceſs than the ſmalleſt, and this by a previous culture and management not hitherto practiſed, by which the moſt valuable deciduous Foreſt Trees will advance in growth, as well as thoſe planted when young; by this method the expence of ſtaking is avoided, and they will reſiſt the moſt impetuous winds, the greateſt enemy of new-planted trees raiſed and managed in the common way.

By the proceſs which is purſued in this treatiſe, trees may be planted with the moſt certain ſucceſs, and without any ſenſible check to their growth, during all the ſummer months, without any additional expence, further than two or three extraordinary waterings. This circumſtance alone ought ſurely to be of much conſideration in this climate, (Scotland), as our grounds in winter are uſually ſo much locked up with froſt, flooded with rains, or the weather otherwiſe ſo intemperate,

temperate, that our planting ſeaſon is confined to a ſmall part of the ſpring and autumn. I ſhould likewiſe imagine, that men of fortune, who ſpend the winters in the country, could hardly be more agreeably entertained, during the milder ſeaſon, than, as it were, creating (if I may be allowed the phraſe) verdant groves, ſpacious avenues, or pruning the ground for timber.

Nor is this plan confined to deciduous trees; it extends to many of the beſt Evergreens, the greateſt part of which are generally thought unfit for planting, after they have come to be four, five, or ſix years old: But the reverſe is here made evident, founded on principles collected from practice and experience, Nature's true guide, ſo that however improbable this practice has hitherto been thought, it may by attending to the directions here given be purſued, and the trees ſafely removed at the height of eight, ten, and twelve feet, according to their different ſpecies.

On the ſame principles, and with the ſame advantage, Thorns, and many other plants, may be removed, ſo as to form immediate fencible hedges that will reſiſt cattle, ſhelter the ground, and ſave the expence of ditches, palings, and other fences neceſſary to protect them when young.

To which is added, *Obſervations on the beſt method of planting Hedges, adapted to various ſoils and ſituations*, which, for their more readier conception, the different ſections are repreſented in an engraved Copper Plate. Any improvement made on this ſubject is certainly of great and univerſal concern to this kingdom. For by not properly attending to this neceſſary work, but leaving it to ignorant gardeners, or common labourers, much diſcouragement has been given to incloſing with hedges; and many perſons of fortune in this country have, within theſe few years, beſtowed large ſums in that way to very little purpoſe.

Several uſeful diſcoveries are alſo ſubjoined, on the improvements that may be made by Grafting and Inoculation, on ſtocks that will inlarge the ſmaller kinds of plants, and render the tender more hardy.

As incloſing ground with hedges, and raiſing plantations of Foreſt-Trees, are the firſt principles, and moſt ſolid foundation for promoting the different branches of huſbandry and gardening, and which muſt be ſingularly uſeful to our northern climate in improving, and as it were meliorating it for the more favourably raiſing of the tender ſorts of trees, therefore the greateſt encouragement is due from all lovers of their country, to thoſe who ſhall contribute to the executing theſe important points, in a ſucceſsful and more expeditious manner than is generally practiſed,---though I am ſorry to ſay, we are leſs attentive to, and farther behind in the knowledge of the beſt methods for effecting this, than in moſt other improvements. We evidently find, that, to procure the quick growth and pleaſing figure of our native hardy plants, we muſt give them the mutual aſſiſtance of each other; but how much more neceſſary muſt ſhelter be for rearing the tender foreign ſort with any degree of exuberance of growth, is too evident. To this alone, we are indebted for the choiceſt delicacies of our table, and the more refined pleaſure of viewing a vaſt variety of the moſt beautiful plants in nature, and notwithſtanding the original production of more temperate climates, flouriſhing in our open air.

Since a good nurſeryman can ſooneſt and moſt effectually procure us ſuch eſſential advantages and pleaſures, I cannot help thinking him, for theſe and many other reaſons, juſtly intitled to be ranked in the higheſt claſs of gardeners; but what we have moſt to lament is, the few we have amongſt us, but which muſt not long be our ſituation, from that ſpirit of planting and improving which almoſt univerſally appears through the country. The returns of profit from the nurſery are tedious, and to proceed in it to any conſiderable degree, can only be in the power of men of capital, as they muſt long be out of their money; the occaſion we have ſo few good nurſeries in this kingdom, which is really an object worthy of public conſideration as well as encouragement.

From the general bad and inſufficient ſtate of nurſeries in this kingdom, I cannot help making it known to the public, and particularly to the Honourable Board of Police, to whom Scotland is much indebted for that rapid progreſs ſhe has made in arts, and the conſequence ſhe now holds in the commercial world. It is with the moſt humble difference I point out to them the line of improvement juſt mentioned, which we may flatter ourſelves will become an object of that truly patriotic body, and which might be executed at no great expence, as an honorary reward would be ſufficient, which might be given at the end of four, five, or ſix years, as they may judge moſt proper, to the perſon who ſhall raiſe, from the youngeſt to the largeſt plantable ſizes, the greateſt number of the beſt cultivated Fruit and Foreſt-trees, Hedge-plants, and other uſeful nurſery articles, in proportion to the extent of land employed for theſe purpoſes, and ſubject to the inſpection of a committee of ſkilful perſons appointed by the ſociety to viſit the nurſeries about Edinburgh, or where elſe they ſhall think them worthy of notice in Scotland, either at mid-ſummer when cloathed with their leaves, or in autumn before the planting ſeaſon begins,---to inſpect the various methods of their culture, and general ſyſtem of management, ---to ſee ſpecimens of the plants raiſed, for an examination of their roots, as well as from a juſt attention to pruning the proportion of their bodies,---and to advertiſe in the uſual way the perſon moſt deſerving.----This I am perſuaded would bring us more forward in the road of general improvement of planting, than from all the writings and examples of the ableſt men, or even from any other method that can be deviſed for the purpoſe. This would be making a man of real merit in his profeſſion juſtly conſpicuous; it would detect the ignorant pretender. Were this to be our happy ſituation, every man of abilities would exert himſelf, both as the means of ſupporting his reputation, and rendering him conſpicuous to gentlemen engaged in improving their eſtate or domains, and conſequently find a very material difference in the quality of even the common plants from their improved culture.

It has been almoſt an univerſally received opinion, that trees ought to be raiſed in the nurſery on a poorer ſoil than that to which they are afterwards to be tranſplanted for good; and this has been directed by many of the moſt reſpectable writers. I muſt acknowledge this doctrine has a very ſpecious appearance at firſt view: I followed it early in life, and as ſeemingly a conſiſtent practice, nor was I ſingular in this, as the ſame had been purſued by many young planters; but how it happens that the fallacy has not been until now exploded, I am not able to account, as the contrary has been long ſince diſcovered by thoſe attentive to their profeſſion.

In the following ſheets I have given ſome examples, from frequent and repeated experiments, of the ill effects I have diſcovered from planting young and tender ſeedlings in the pooreſt ſoils, and the greater ſucceſs attending thoſe that were well-grown, on the ſame, or in ſimilar ſituations. The conſequences of raiſing plants in a poor hungry ground, are no leſs fatal than planting the ſeedlings in ſuch, and ſhould as much as poſſible be avoided. In the culture directed for different trees, the neceſſity of promoting very early their vigorous growth is aſſerted, in order to their becoming ſtately and handſome plants; as it cannot be effected by any other means, than being early nurſed in a generous ſoil, for whatever future purpoſes they are intended, or to whatever ſituations they are deſtined; and that if they are but barely ſupported from infancy on poor ground, they will never afterwards become ſtrong, though removed to that which is rich and feeding. The cauſes for this, will be evident upon an enquiry and eaſily demonſtrated: From their harſh and unfriendly food they contract diſeaſes, which, if not immediately mortal, are certainly incurable; they neceſſarily have bad roots, they are hide-bound, and their branches weak and crooked; in ſhort, though they may long languiſh in the ſtate of buſhes, they will never arrive to the magnitude of what may be properly called trees.

But though I have directed trees to be raiſed on good land, let it be underſtood, I mean that only which is naturally ſo, and not what has been forced and pampered with dung, or at leaſt before that dung has been mellowed and reduced to the conſiſtence of earth, ſuch being yet more baneful to trees in general, than even the pooreſt ſoils.

As I have in the courſe of my directions for the culture of the different trees, pointed out the ſoil that beſt agrees, I ſhall not attempt any thing of that ſort here, but mention in general, that the moſt deſirable ſoil for a nurſery, is that which is looſe and dry, reduced to the ſmalleſt particles by frequent digging and raking; that which is moſt to be avoided is what approaches neareſt to a heavy moiſt clay, wherein trees will neither root liberally, nor will our uſual winter and ſpring weather admit of being cultivated, but at particular, and frequently too late periods; hence it is impoſſible, that buſineſs can be carried on ſeaſonably, to any conſiderable extent, in ſuch grounds.

I am not inſenſible of the ineffectual attempts that have been made to tranſplant large trees, and how much it is conſidered as impracticable, owing to a total ignorance of the proceſs, which I have given in this treatiſe, in which will be found the former errors corrected, and a rational ſyſtem given, founded on nature, and confirmed by experience.

Large trees raiſed and cultivated agreeable to theſe directions, ſo far from not ſucceeding as well as thoſe planted when young, will grow much more freely, from their greater abundance of roots ſpreading near the ſurface, and enjoying all the benefits of the heavenly influences, than ſuch whoſe roots, being deeper, are ſtruggling with a cold, inactive, and inanimated ſoil.

When a plantation is made of young trees, the trouble and attention attending it can only be ſaid to be begun, but theſe made of trees that are above the ſize of being injured by cattle, and reduced to their proper form by different prunings, require little or no further attention; and immediately affording that pleaſure, which the former practice we twenty years would be in acquiring.

The proceſs I have here recommended, will enable ſuch as are above the regard of common expence, to have plantations of well-grown trees in one ſeaſon, as the principles on which the whole of the plan proceeds are infallibly certain, and have ſtood the teſt of ſeveral trials, and the ſucceſs, a moſt ſubſtantial pleaſure.

However ſome may recommend their pieces for originality, I ſhall be contented to rank my labours in a more humble walk, acknowledging a tribute of gratitude to thoſe whoſe labours I have advantaged by, and whoſe hints I have improved upon, and laboured to frame into rational and practical ſyſtems, which I have ever conſidered as doing more real ſervice to thoſe for whom I write, than to lead them into a labyrinth of difficulties and ſpeculations.

I ſhould be unworthy the patronage that has been ſo liberally given me, in that very noble and honourable liſt of ſubſcribers, that appear to countenance and reward my labours; which I will not attempt to attribute to my fame or the value of my treatiſe, but to a more pleaſing proſpect, of a general deſign of improvement in my country, as for her I feel more than for myſelf; this diſpoſition within theſe few years, has made a moſt rapid progreſs, and riſing in many places with a peculiar ſplendor, as well for arts, agriculture, and manufactures, the huſbandry we are now purſuing, will in a few years bring as forward, and render this kingdom reſpectable in a ſcience always patroniſed by the great and encouraged by the judicious, affording employment for the induſtrious, and plenty to the ſtate.

BRITISH MUSEUM
15 SEP 62

CONTENTS.

DECIDUOUS TREES, with their different Species.

CHAP. PAGE.
I. *The* ELM TREE,. — — 1
II. *The* BEECH TREE, — — 22
III. *The* Platanus, *or* PLANE TREE, 27
IV. *The* MAPLE TREE, — — 32
V. *The* OAK TREE, — — 38
VI. *The* ASH TREE, — — 51
VII. *The* LIME TREE, — — 57
VIII. *The* HORNBEAM TREE, — 63
IX. *The* WALNUT TREE, — 67
X. *The* CHESNUT TREE, — 75
XI. *The* HORSE-CHESNUT TREE, 83
XII. *The* Larix, *or* LARCH TREE, 86
XIII. *The* VIRGINIAN TULIP TREE, 94
XIV. *The* ACACIA TREE, — 99
XV. *The* WILD CHERRY TREE, *in* England *commonly called the* Black Cherry, *in* Scotland *the* Geen Tree. 103
—*This chapter alſo contain the* BIRD CHERRY, *in* Scotland *called the* Hagberry, — — 107
XVI. *The* POPLAR TREE, — 109
XVII. *The* Lote, *or* NETTLE TREE, 117
XVIII. *The* Laburnum, *or* BEAN-TREFOIL, 121
XIX. *The* ALDER TREE, — 124
XX. *The* BIRCH TREE, — — 126
XXI. *The* SERVICE TREE, — 130
XXII. *The* JUDAS TREE, — — 134
XXIII. *The* ELDER TREE, — — 141
XXIV. *The* TACAMAHACA TREE, — 148

EVER-

CONTENTS.

EVERGREENS, with their different Species.

CHAP. PAGE.
XXV. *The* PINE TREE, — 150
XXVI. *The* FIR TREE, — 163
XXVII. *The* CEDAR TREE, — 176
XXVIII. *The* CYPRESS TREE, 188
XXIX. *The* Arbor Vitæ, *or* TREE of LIFE, 194
XXX. *The* Ilex, *or* EVERGREEN OAK TREE, — — 199
XXXI. *The* CORK TREE, — 205
XXXII. *The* HOLLY TREE, — 209
XXXIII. *The* YEW TREE, — 220
XXXIV. *The* Laurel, *or* CHERRY BAY TREE, — 225
XXXV. *The* BAY TREE, — 231
XXXVI. *The* Arbutus, *or* STRAWBERRY TREE, — 236
XXXVII. THORNS,——*their culture from the ſeed, till they arrive to the ſize of becoming fencible Hedges at tranſplanting,* — 242
XXXVIII. *On the propagation of* TREES *by* Layers, — 269
XXXIX. *Some Hints on* PLANTING, *by a Planter in* Ireland, 272
XL. *On* GRAFTING *and* INOCULATION, —— 285
XLI. *On* FORESTS *and* WOODS, *and the moſt ſpeedy manner of* planting *them*, —— 294
XLII. *On making* TREES fit for removal, *that have ſtood uncultivated, and too thick, in Nurſeries or Woods*, —— 308

BRITISH MUSEUM 15 SEP 62

A
TREATISE
ON
FOREST-TREES.

CHAPTER I.

THE ELM TREE.

A Deſcription of its Flower and Seed.

The flower has a rough permanent empalement of one leaf, cut at the rim into five points, and coloured within; it has no petals, but has five awl-ſhaped ſtamina, twice the length of the empalement, terminated by ſhort erect ſummits, having four furrows, and an orbicular erect germin, ſupporting two ſtyles which are reflexed, and crowned by hairy ſtigmas. The germin afterward turns to a roundiſh, compaſſed, bordered capſule; including one roundiſh compaſſed ſeed.

The SPECIES *are:*

1. The ſmall-leaved or true ENGLISH ELM;
2. The ENGLISH ELM with large rough leaves;
3. The FRENCH ELM;
4. The rough-barked DUTCH ELM;
5. The CORNISH ELM;

6. The Red Elm from Canada;
7. The Scotch Elm in England, called the Witch Elm;
8. The English Elm with ſtriped leaves.

THE five ſorts firſt mentioned are propagated by layers or ſuckers, the former of which is by much the beſt method, as the trees, ſo raiſed, will, in their firſt ſtages, advance more in growth, and make handſomer plants than thoſe taken from the roots of old trees; neither will they ſo ſoon, or in ſo great a number, produce ſuckers, which retard the growth of the tree. I ſhall therefore firſt deſcribe the manner of raiſing thoſe kinds in that way, and proceed to the beſt methods of their culture, from the mother, till they arrive to the height of thirty feet or upwards.

Having prepared a ſpot of ground, neither too light and thin, nor too moiſt and heavy, but freſh and mellow, that has been well trenched the preceding year, from which all weeds and ſtones have been carefully picked out, and that has been a year or two employed in leafy kitchen-garden crops; let it be well dug, and levelled the beginning of October: Then provide yourſelf with ſtools, or mother-plants; let them be ſuch as have ſtood ſeven years, and were cut down the fifth; the ſhoots being now of two years growth, are to be cut down to the length of two or three inches; the ſtools are then to be raiſed and planted at eight feet diſtance in the Quincunx order, and ſhould the ſituation not incline to moiſture, let each be planted in an hollow formed like a baſon, the better to retain the advantages of deſcending rains and dews; at planting give them a gentle watering, to ſettle the earth about their roots.

BRITISH MUSEUM 15 SEP 62

If you cannot procure ſuch as have been cut with a view for rearing mother-plants; chooſe from the nurſery ſuch ſound vigorous trees, as are of about ſix or ſeven years growth; and if they have been twice or thrice tranſplanted, ſo much the better, for, by having abundance of roots, they will produce plenty of ſtrong ſound branches: Cut them ſlanting, to about eighteen inches or two feet above ground; then make a trench long enough to receive them lying on their ſides, ſloping ſo as their roots may be covered ſix or ſeven inches, leaving no more than three or four inches of their tops to appear above the ſurface; let the wounded parts, which ought to be cut very clean and ſmooth, incline to the ſurface, to prevent their being injured by the winter rains; lay them at eight feet diſtance one from the other, and water them to ſettle the earth about them, keep them clear of weeds, frequently ſtirring and looſening the earth about them, ſo as to receive the full benefit of the ſummer rains and dews. If the ground is of a good quality, and the ſeaſon favourable, many of them will be fit to lay the following October; and ſuch ſhoots as are too weak for laying then, being again cut, will produce ſufficient to furniſh the ground with a full crop of layers the ſucceeding autumn.

As early in October as the weather will permit, begin laying your Elms, giving them a gentle watering, which, in dry weather, ſhould be frequently repeated during the ſummer months; the expence whereof will be amply repaid by the well-rooting and ſtrength of your layers. The method of performing this operation on different trees, will be directed in a chapter ſelected for the purpoſe, to avoid repetition.

The following October, if the branches have been ſkilfully laid, and the ground managed as directed, moſt of the layers will be ſufficiently rooted; when, having prepared a ſpot of good mellow ground, as for the ſtools, carefully uncover the plants, whoſe fibres are at this time extremely tender; raiſe them gently with the ſpade, and with a ſharp knife cut them at the extremity of their roots, and ſuch of them as have not puſhed out fibres at the joint where they were laid, but are what the gardeners call *club-rooted*, ſhould be thrown away, as they will never make good plants, or reſiſt the winds: Having ſeparated them from the mother tree, trim away ſuch of the ſmall hairy fibres that are bruiſed and broken, as they are apt to mould, and endanger the tree; but be very ſparing of what is freſh and ſound, ſhortening them and the principal roots but moderately, tho' many faſhionable gardeners make a little too free in this point, by cutting moſt of them away, endeavouring to ſhow their addreſs, by making trees grow without them; keep them out of the ground as little time as poſſible; cut them down to about a foot in height, and plant them in lines three feet aſunder, and eighteen inches apart in the lines. Here let them remain two ſeaſons, when they are again to be cut down, in the beginning of March, within two or three inches of the ſurface: By this time the plants will be well rooted, and, the ſucceeding ſummer, in a good ſoil and temperate ſeaſon, they will produce ſtraight clean ſhoots, four and five feet high. In March following, prune away all ſtrong lateral and ill-placed branches cloſe to the ſtem, but leave ſeveral of the ſmaller ſhoots, more or leſs as the plants are thick or ſlender bodied, to detain the ſap, and augment their trunks; this not being properly attended to, is the occaſion of many trees growing, with ill proportioned trunks, to great heights, that is, with ſlender bodies and heavy tops, unable to ſupport themſelves; but bending almoſt to the ground with every guſt of wind, and of courſe, never can arrive to that magnitude or beauty, we would wiſh to ſee them. Here theſe trees may remain another year, when, if they are intended to be made fit for tranſplanting at a large ſize, they muſt be removed to another nurſery, and planted at greater diſtances: But before I proceed to that, I ſhall direct their culture from ſuckers, and from the ſeed of the Scotch Elm, until they are fit to be treated in the ſame manner as thoſe juſt directed, the ſame management anſwering the different kinds. It may here be neceſſary to obſerve, after having cut down your Elms, or indeed any other tree, that, as ſoon as the young ſhoots appear, you ſhould rub off all but the moſt promiſing, which will much advance their growth.

Being provided in the ſpring, when the ſap begins to riſe, with ſuckers grubbed up from the roots of old trees, which are preferable to the autumnal ſhoots; cut off all the bruiſed and broken roots, trim the ſhoots to about ſix or eight inches high; lay them in drills cut out with the ſpade, eighteen inches line from line, and eight or nine inches in the line; give them a gentle watering, and keep the ground clean and looſe about them: Having ſtood here one year, cut them down to the ground, there to remain another, when they ought to be raiſed and planted in a ſeparate nurſery, at double the former diſtance. Such of them as have made ſtrong ſhoots, and thick in proportion to their height, may be planted without ſhortening; but ſuch as are dwarfiſh and ill-formed, or out of proportion, muſt be ſhortened again, more or leſs as they have good or bad roots; thoſe with good roots to be leſs reduced in their height than the others, which ought to be an invariable rule in the pruning all ſorts of Foreſt-Trees: In this ſituation, let them remain two, but not to exceed three years, managing them in all reſpects as the layers.

The Canada Elm having been lately imported into Britain, they are not yet arrived to any magnitude with us, but in their native ſoil they grow to a vaſt ſize. I have only cultivated them within theſe laſt three years, during which time they have conſiderably exceeded in growth all the other different ſpecies of Elms, and there is a very promiſing appearance that they will ſoon become ſtately trees in this climate (Scotland). I have with eaſe increaſed them from layers, and they root more abundantly that way than the Engliſh Elm. I have alſo ſucceſsfully grafted them on Engliſh, Scotch, and Dutch ſtocks, and the moſt vigorous ſhoots have been from the Dutch, though theſe on the Engliſh ſeem to have a more elegant form: Their leaves are broader than thoſe of the Scotch or Dutch Elm, but ſmoother, and of a more lively green; from which circumſtance, they ſeem to claim our encouragement. Theſe trees produce plenty of ſeed in Canada, from whence they may be eaſily procured; but from the length of the voyage, and the delicacy of the ſeed, they ſeldom arrive ſufficiently freſh in Britain: Therefore, the readieſt way to cultivate them here, is from layers, or by grafting; and ſuch plants perhaps will be hardier than thoſe raiſed from foreign ſeed.

The Scotch Elm may be propagated by layers, with the ſame advantage as the other ſorts, and will produce abundance of roots with greater facility, and in coarſer land, than the Engliſh; but as they generally yield abundance of ſeed, and great numbers may be wanted, I ſhall direct their culture, and more particularly, as it is the cheapeſt way of raiſing them.

The ſeed of this tree commonly ripen from the beginning until the middle of June, as the ſeaſon is more or leſs forward: It is eaſy to diſcover their ripeneſs by the huſk being full and firm, inclining to a tawny brown colour. The ſeed muſt be attentively looked over, as they approach to maturity; for when they are fully ripe, a blaſt of wind, or a heavy ſhower will diſperſe them, as I have frequently experienced, when it will be difficult to gather any quantity of them, the ſeed being very ſmall, and totally impoſſible where the ground is under graſs, or of an uneven ſurface; but what I would recommend, is, as ſoon as the gathering ſeaſon arrives, is to make choice of one of the moſt fair looking trees, into which let a man mount to ſhake the branches, firſt ſpreading a ſheet under it. By this practice, you will have no other but the moſt generous full ripened ſeed, a circumſtance of no mean conſideration in your future ſucceſs; whereas, in the common way of ſweeping the ſeed from the ground, there is always gathered abundance of chaff, with much weak and unripened ſeed.

The common practice is to ſow the ſeed a few days after gathering, by which means a number of them will riſe in four or five weeks; but theſe coming up in the very warm ſeaſon, and not having a ſufficient continuance of it, to make them ſtrong plants before the hard weather comes on, are commonly forced out of the ground by the winter froſts; but ſhould the winter prove uncommonly mild, ſo that they ſtand it out, yet they will be weak and ſtunted, and hardly ever make handſome free growing trees; and though the moſt part of the ſeed will not appear until the following ſpring, yet, from the ground being hard and battered with the winter rains, they will make but poor ſhoots, compared to thoſe that are raiſed in the ſpring on a well-prepared ſoil: It is therefore by the latter management, that you can expect to raiſe vigorous and healthful plants, not only of theſe but of any other kinds; and it is but loſt labour to attempt to recover ſuch as have been ſtarved and ſtunted, as they can never be formed into pleaſing trees. For theſe reaſons, I ſhall not pay any regard to common rules, however prevailing, further than I have found them to ſucceed in practice. What I ſhall lay down for to be followed, is what I have experienced in my practice, and by which I have raiſed this very valuable tree, to a ſurpriſing ſize in a few years.

As ſoon as the ſeed is gathered, ſpread them on canvaſs in the open air, but not expoſed to a warm ſun, as it would dry them too faſt, and exhale their vegetative juices; turn them over frequently, ſeparating the cluſters for the readier drying, which will prevent their growing muſty; let the ſeed be placed under cover in the night, to protect them from rain and the dews, which care muſt be continued as the weather proves temperate and clear, or damp and cloudy, but in the general it will require ten or twelve days of ſeaſonable weather to prepare them for keeping. After this, the ſeed are to be put into bags, but not preſſed down, and laid in the ſeed-loft, there to remain five or ſix weeks, by which time they will become dry and firm, without having loſt any of their vegetative quality, and the growing ſeaſon being near over, they will be in no danger of ſpringing too early. From the ſeed-loft let the ſeed be removed to any covered ſhady place in the nurſery, mixing them with one-third of fine ſand to two of ſeed, covering the whole four inches thick with more ſand or fine looſe ſifted earth, to prevent any injury from the froſt; and in this ſtate to remain until the following February.

About the 12th of that month, or as ſoon as the weather will permit, prepare a ſpot of looſe rich garden earth, made perfectly clear of weeds, to be finely raked: Divide this plot into beds of three and a half feet wide, with alleys of eighteen inches: Move off a little of the earth with the head of the rake, as is practiſed in ſowing onions, and other ſmall kitchen crops; then ſow the ſeed moderately thin, (thick ſowing being an almoſt univerſal though capital error in this and moſt kinds of tree-ſeeds); preſs the ſeed gently into the bed with the back of the ſpade, this will leave a ſmooth level ſurface, which will be eaſily covered, on which draw over the earth that has been moved off the bed, as firſt directed, throwing on a little more from the alleys, until the ſeed is covered to the depth of half an inch, but not more, deep covering being one of the many errors I have to correct.

The beginning of April, the ſeed will appear above ground; when, ſhould the weather prove dry, and not froſty, the ſeedlings are to be refreſhed with frequent, but very gentle waterings, either in the evening, or early in the morning, and carefully kept clear of weeds, otherwiſe many of the plants will be loſt, and the growth of the remainder much impeded.

Should the ſeed be ſown in a good well-prepared ſoil, and the ſeaſon prove favourable, the plants are all to be taken up the following ſpring; but if the ground ſhould prove unfavourable, and of courſe the plants ſmall, they muſt ſtand another year; however, it will be proper to draw out the largeſt, otherwiſe they will ſo much overſhadow the ſmall ones in the ſummer, as to deprive them of air and moiſture, and conſequently rob the greateſt part of them of their proper nouriſhment.

The ſeparating of the larger from the ſmaller plants, in all kinds of nurſeries, is of great conſequence, both in point of uſe and beauty, than is generally attended to, as, from this practice, the trees nearly keep pace one with another, which contributes not a little to their preſervation, being equally expoſed to the vegetative powers. This care I would recommend to be obſerved and attended to, not only in the nurſery, but when trees are planted where they are to remain.

Theſe plants having been carefully raiſed from the ſeminary with all their fibres, ſhorten their toproots, and commit them to the nurſery, the well-grown in October, but the ſmaller not until February, leſt the winter's froſt force them out of the ground: Plant the largeſt in rows two and a half feet aſunder, and a foot diſtance in the row, where they may remain two years; but let the ſmaller be laid in beds one foot row from row, and about ſix inches in the row, to ſtand one year only, when they may be treated as the larger ſeedlings, and like them to ſtand two years longer.

The Engliſh Elm with ſtriped leaves, may be grafted on any of the Elms, though on the plain

Engliſh they make the handſomeſt plants; but in order to preſerve their original variegation, they ought to be planted on a poor light ſoil, as in deep rich ground they loſe much of that beauty, and ſometimes turn quite plain, though the moſt effectual method I have ever found, for preſerving the colours of this and many other ſtriped plants, is to propagate them from layers of trees that are richeſt in their variegation, which will be acting with the greater certainty, than to uſe ſuch as have been grafted on plain ſtocks.

Beſide the common method of raiſing Elms from layers, ſuckers and ſeed, there are many propagated, by grafting and inoculating the Engliſh kind on Scotch ſtocks. For certain ſoils and ſituations, this is a very great improvement; but where that is not judiciouſly conſidered, it may have a very oppoſite effect: I ſhall therefore (having tried many experiments on this favourite tree) be particular in pointing out the advantages, or diſadvantages, of propagating the Engliſh Elm by grafting, and adapting the ſtocks on which they are to be grafted to the ſoils where they are to be planted, which will prove not leſs pleaſing than profitable.

Where the ſoil is dry, ſound, and generous, and the climate good, there is not any ſpecies of the Elm yet familiar to us, equal in beauty to the true ſmall-leaved Engliſh, from layers of its own kind; nor has it any fault, but being unkindly to root (when unſkilfully laid), and in ſtormy ſituations reclining from the wind; but, by the preſent ſyſtem of culture, theſe defects will be entirely remedied, and it will root as freely as the Scotch Elm, or any other tree, and reſiſt the moſt impetuous winds equally well.

Next to the true Engliſh, I eſteem the Corniſh Elm as the fineſt tree of this tribe, both for loftineſs of growth, elegance of form, and the lively chearful verdure of its leaves.

The Engliſh Elm grafted on the Scotch makes both a beautiful and a valuable tree, yet it is ſtill inferior in regularity of form, and loftineſs of ſtature, to thoſe raiſed from their own mother; and as every tree muſt in ſome meaſure partake of the ſtock on which it is grafted, ſo this has a near reſemblance of the Scotch Elm in its bark even when young, and when old, like them, grows more looſe, ſpreading, and leſs erect than the true Engliſh, though, when young, they are extremely beautiful.

Where the land is tolerably deep, though coarſe, and inclined to clay or till, thoſe on Scotch ſtocks will ſucceed better than the Engliſh on its own bottom; but where the ground is thin and hungry, it is in vain to plant them.

On moiſt, heavy, coarſe, and even wet lands, that have any competent degree of ſtrength, plant the rough Dutch Elm; and in ſuch ſituations, I have even raiſed thriving plantations of the Engliſh, grafted on their ſtocks, which made a fairer tree than thoſe on the Scotch ſtock, and has a nearer reſemblance of the true Engliſh, than the Dutch Elm has. At the ſame time, though this plant moſt generally affects a deep ſoil, I have ſeen many of them, and very ſtately trees, growing on burning ſand and gravel.

The French Elm delights in a deep rich moiſt earth, where they will make amazing progreſs, and become beautiful trees. But for ſuch a ſituation, ſhould the Engliſh Elm be choſen, graft them on ſtocks of the French, as they make the fineſt plants of the whole tribe, the Engliſh on its own ſtem excepted, and which has no competitor, when ſuited to its proper ſoil.

The French Elm may alſo be much improved, by grafting it on the Engliſh, when they can be planted in ſuch ſoil as is directed for them.

Here it may not be unneceſſary to obſerve a practice extremely common amongſt ignorant nurſerymen, which is, cutting their Engliſh Elm grafts from thoſe on Scotch ſtocks, and which indeed have the faireſt and plumpeſt buds, (a plain indication from whence they immediately proceed, the buds of the Scotch being larger and more turgid than thoſe of the Engliſh) but theſe gentlemen either do not regard the quality of the plant, or are ignorant, that, by repeating this practice, the Engliſh Elm may be brought ſo far to degenerate, by repeated graftings, as to differ very little from the Scotch; therefore, whatever kind the ſtocks are of, on which you graft the Engliſh, let the grafts be taken from trees of the true kind, raiſed by layers from their own mother. That this is but little attended to, many gentlemen from frequent diſappointments can teſtify.

It may alſo be proper here to notice, that all Elms planted in gardens, and by the ſides of walks, lawns, or avenues, ought to be on Scotch ſtocks, as theſe produce no ſuckers, which the Engliſh, French, and Dutch do, and in ſuch abundance, as to create a great deal of trouble and expenſe to keep ſuch places clear of them, and in good order.

I am well aware that the ignorant part of my profeſſion (whom I hope are not the majority) will ſay, here is a great deal of time, land, and labour loſt, in cutting down trees before they are ready for ſale, or at any rate, which had they remained uncut, would have been larger in the time, and conſequently higher priced. According to the common practice, where ignorance and diſhoneſty go hand in hand, it will be difficult to convince ſuch men of their real intereſt, which they perhaps believe conſiſts in getting money by whatever means they may, without any regard to credit. Such will not eaſily relinquiſh their former ill-habits, or reflect, that a perſon of taſte and knowledge in gardening would chearfully reward their patience and induſtry, by readily paying a higher price for a handſome vigorous plant, and on which they could have a reliance for ſucceſs, than for one that was as unſhapely in its appearance, as unpromiſing for growing. To ſuch therefore I do not mean to addreſs myſelf, but to thoſe of more liberal ſentiments. I will boldly affirm, that though a little more land and labour is beſtowed, there is in the end no time loſt, but much anticipated by this operation, as, in four or five years, the trees cut down will be conſiderably larger than thoſe that have been otherwiſe treated, with this further deſirable circumſtance, that, inſtead of being ragged, unſightly, and ill-rooted, they will be ſtraight and clean-ſkinned, with a much greater abundance of roots. In ſhort, cutting down the trees eſtabliſhes their growth, by diverting the ſap to the root, frees them from many injuries, and by being well rooted, are enabled to withſtand our winds, and produce handſome and generous ſhoots, infinitely preferable to ſuch as are abandoned to nature, and accident without this diſcipline; and when ſeaſonably practiſed, nothing will ſo much accelerate the ſucceſs of plantations, and give many years in advance, not more in this tree than in many others, as has been experienced by many lovers of improvement, not only here, but in a neighbouring kingdom, whoſe climate nearly reſembles our own; of which every gentleman muſt be convinced, (however they may not at firſt be ſatisfied) who have ſeen a Piece entitled, *Some Hints on Planting*, by a Planter, publiſhed at *Newry*, in *Ireland*, whoſe Author I am ſatisfied is a real friend to his country, from the pains he has taken for its improvement.

Thus having directed the beſt methods of treating theſe plants in their early ſtages, and which indeed is all the culture commonly beſtowed on them, for whatever purpoſes they are deſigned, or at whatever ſizes to be removed: I proceed to their management for a ſucceſſion of years, with a view to their being tranſplanted when large trees, and which, by obſerving the rules here laid down, they may be, with the moſt certain ſucceſs, to any ſize, capable of being raiſed and moved.

Theſe trees, if planted in a good ſoil, having now arrived to the height of ſix or ſeven feet, the ſame practice will anſwer for the different ſorts of Elms.

Your ground being prepared by a good digging, which on this occaſion I prefer to trenching, (as a deep looſe ſoil would invite the roots downward, whereas the preſent ſyſtem requires their ſpreading as much as poſſible near the ſurface), raiſe your plants carefully, with all their hairy roots and fibres; reduce the downright roots conſiderably, but only ſmooth with a ſharp knife the extremities of thoſe that ſpread themſelves; obſerve that whatever earth adheres to the fibres, (if the diſtance of their new quarters is near,) ſhould be preſerved, cutting away ſome of the ſmalleſt ſtraggling hairy parts; for roots are the conduits by which nouriſhment is conveyed, and transfuſed to all parts of the tree. The roots thus prepared; cut away cloſe to the trunk all ill-placed ſtraggling branches, leaving only a few of the ſmalleſt, to detain (as has been already directed) the ſap for the nouriſhment of the trunk of the tree. Plant them in lines four feet aſunder, and eighteen inches in the line; let them be watered, to ſettle the earth about their roots, and in this ſituation they muſt remain two years, which I would not exceed.

From this nurſery remove them to another, dreſſing their roots and bodies as at laſt removal; and plant them in lines five feet aſunder, and two feet in the line, where they may remain for three years more.

Let them be again removed, and planted in lines eight feet aſunder, and ſix feet in the line, in which ſituation continue them four years; let theſe have a plentiful watering, and obſerve that the waterings be increaſed in proportion to the age and ſize of the tree.

The ground between the lines, from firſt to laſt, ought to be well dug every ſpring and autumn, which will much increaſe the number, and promote the ſpreading of the roots, and of courſe the growth of the plants.

The trees being now twelve years old, will be from twenty to twenty-four feet high, and being raiſed in a good ſoil, may be planted out where they are to remain for good, or removed to the fields, or any ſpot of good land moſt convenient, and planted at leaſt ten feet aſunder, to be ready for whatever deſign may be in view, or ſhould afterwards occur; whence, any time from three to ſeven or eight years, they may not only be removed with undoubted ſucceſs, but with ſuch abundance of earth adhering to their ſhaggy roots, and with ſuch ſtrength and proportion of body, as to defy the rudeſt aſſaults of the winds, even at firſt planting, without ſtaking or any other ſupport; which, though an almoſt univerſal practice, is, notwithſtanding, the reſult of ignorance, and is only neceſſary to ſupport the defect of good culture, by proping trees that have been injudiciouſly managed, as none of the ſtraight growing pyramidical trees (the deciduous kinds more particularly) have the leaſt want of that aid, if the directions here given are attended to.

Every gardener, of the ſmalleſt obſervation, muſt be ſenſible, that the rotting of the wounded parts of old trees, is the moſt general cauſe of their dying; but in the practice I have juſt recommended, no violence is offered, no amputation made, but on the young and tender roots and branches, which immediately heal; from hence nature points out, that this proceſs may be continued (particularly with the Elm) while it continues freſh and vigorous, without retarding its growth in any material degree.

That I have been very liberal, if not extravagant, in ground, by the diſtances allowed the plants, and that few nurſerymen have ſuch an extent as to enable them to proceed deeply in this plan, is a reflection I am ſatisfied will be made by numbers; but that I have not exceeded the proper bounds, long experience has convinced me, as it will others who make the experiment as fairly as I have done: But if my aſſertion ſhould not be thought ſufficient without another reaſon, I ſhall give one that I hope will be ſufficiently convincing, which is, by making proper uſe of the vacancies, when the preſent ſyſtem may turn out even frugal. The trees, till they are ſix or ſeven feet high, are allowed no greater diſtance than every ingenious nurſeryman will admit to be a proper medium; after which, when the trees are placed in the increaſed diſtances, they are annually pruned, which gives room for crops of Turnips, Onions, Leeks, Carrots, Beans, Cabbages, Collyflowers, and a variety of garden herbs, without the ſmalleſt injury to the trees; particularly the early crops, from which I have had frequent profitable returns; particularly early turnips, and other tender roots and greens, in ſevere ſprings, when they have been totally cut off in the open quarters of the garden; from which circumſtance it is evident, that trees planted at conſiderable diſtances, and their ſuperfluous branches pruned off, may be cultivated at a much leſs expence than at firſt apprehended.

If the land is thin and hungry, or of a cold tilly clay, on which you intend to plant the Engliſh Elm, the common method of making pits for them, is but loſt labour. In ſuch ſoils the Dutch only will ſucceed, where it is amazing with how many difficulties it will ſtruggle, and ſoon become a large tree. But in theſe unfriendly ſituations, the Engliſh muſt be courted (as well it deſerves) to diſplay its beauty.

To effect this, I know but one certain method, which is, to plant on the ſurface, or as much above it as you can afford ſoil, and raiſe mounds of good earth, ſufficient to cover the roots and eſtabliſh the tree; which, being thus fed, until it acquire its former ſtrength and hardineſs, will afterwards put up with coarſer fare. Beſides, the trees thus propagated, will not incline to run downwards, as thoſe planted young ever do, but will ſpread their roots near the ſurface, within the influence of the ſun's rays, and accumulate all the good nouriſhment the place affords. This elevation of the trees, has a very pleaſing effect in parks, clumps, and lawns.

Tho' I have mentioned particular waterings, it may not be amiſs, in general, to obſerve, that all large trees muſt be watered at tranſplanting: If in October, once will be ſufficient until ſpring; from which time, it ſhould be continued every month until Auguſt, at leaſt in dry weather, or rather when it does not rain plentifully; but theſe planted in the ſpring, will require more frequent and abundant waterings than the others. I would not however have it underſtood, that the directions for giving large proportions of water to the large trees at planting, ſhould be followed when planting out the younger ſorts; though to them it ſhould be given frequently indeed, but ſparingly, as over-watering of young trees, is generally more deſtructive, than quite neglecting them: Let it alſo be an eſtabliſhed principle, that, from once beginning to water ſeedlings, or other ſmall and delicate plants, you muſt regularly continue it, as the weather requires, otherwiſe you will do more harm than good.

I ſhall ſay no more on the culture of this noble, beautiful, and uſeful tree, which well deſerves your utmoſt care and attention to bring it to perfection, and for which it will amply repay you, both in pleaſure and profit; therefore, I again recommend, that, at all the different removals, but particularly the latter, to preſerve the earth that adheres to the roots, in order to accelerate their puſhing out new fibres; for, not being as yet naturalized to the new ſoil, it cannot be expected to grow with the ſame vigour; wherefore I would recommend an addition of this ſoil, as the beſt means in your power of repairing their loſs, and as it were to reconcile them to their new, and perhaps more unfavourable ſituation.

I have been not a little ſurpriſed, to find that ſome authors of reputation have pronounced the French and Dutch Elms, as trees of no value, either for uſe or improvements; and which I cannot account for in any other way, than their having miſtaken ſome other ſpecies for theſe trees. It was early in life that I began my obſervations; and the Elm being a favourite with me, I was determined to be ſatisfied in that particular, therefore I ſent both to France and Holland, for the different kinds, getting the French from Paris, and the Dutch from Rotterdam, which were the mother-plants of ſuch as I have ſince raiſed of theſe kinds. The French Elm, planted in ſuch ſoil as has been directed, makes a beautiful tree; it grows faſt, and the wood, though not quite ſo hard as that of the Engliſh or Scotch, is yet a valuable timber, and not much inferior to them. The Dutch Elm, tho' inferior in beauty and elegance of form, is, notwithſtanding, a very valuable tree, particularly in this climate, (Scotland,) it ought to be highly cheriſhed, and much made uſe of by us, as it ſucceeds in wet obſtinate clay land, where no tree I know of equal uſe, except a few aquaticks, will grow freely, and ſoon become a ſtately tree; and though the wood is not equal to the other kinds, it is ſtill an uſeful wood, and purchaſed by the carpenter.

In Scotland, the dealers in timber are partial, or ignorant with regard to the Scotch Elm, giving it a preference to the Engliſh: But to this, it is not in the leaſt entitled; for having cut down many of theſe trees, I weighed a cubic foot of the one and the other, cut at the ſame time, and always found the Engliſh the cloſſeſt and moſt ponderous.

I have ſold about ſixty Engliſh Elms, at twenty-four years growth, of my own raiſing, at a guinea each, and theſe not ſelected but taken in the line: They were in general of about eighteen inches diameter, a foot above the ground, and forty feet high.

CHAPTER II.

THE BEECH TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers on the ſame tree; the male flowers are collected into globular heads; theſe have no petals, but have ſeveral ſtamina included in an empalement of one leaf, which are terminated by oblong ſummits. The female flowers have a one-leaved empalement cut into four parts, but have no petals; the germin is fixed to the empalement, ſupporting three ſtyles, crowned by reflexed ſtigmas. The germin afterwards becomes a roundiſh capſule, armed with ſoft ſpines, opening in three cells, each containing a triangular nut.

The SPECIES *are:*

1. The common BEECH.
2. The yellow-ſtriped BEECH.
3. The white-ſtriped BEECH.

THE common method of raiſing theſe plants, is, ſowing their ſeed very thick in beds, early in the ſpring, there to ſtand two years; or, to draw a part of them the firſt and ſecond year, and to leave the remainder until they are three years old: Yet this, however general, is a very bad practice, as the plants that are drawn have moſt of their tender fibres torn away, (an injury they will not ſoon recover); and what remains, will be carrot-rooted, and ſuffer much, by the neceſſity of ſhortening their roots (then hard and woody) when tranſplanting them. I ſhall therefore leave the beaten path, and direct the practice I have found more ſucceſsful in the culture of this tree, and brings it ſooneſt to perfection.

Being provided with maſt gathered in autumn, from the ſtraighteſt, and moſt vigorous growing trees, the huſks being quite dry, mix them with ſand, and lay them under an old hot-bed frame, or other covering, to protect them from froſt and wet. This will prepare the ſeed for vegetation, and diſappoint the mice, who generally have a large ſhare of them, when early ſown.

In the beginning of March, ſow them thin in ſhallow drills, about eighteen inches aſunder; and if the ſeaſon is dry, and water at no great diſtance, give them frequent, but moderate ſprinklings, on their beginning to appear above ground, until the middle of Auguſt, which will much forward their growth.

About March in the next ſeaſon, (with a ſpade made very ſharp for the purpoſe) undermine the roots as they ſtand in the drills, and cut them to between four and five inches under the ſurface.

In the following autumn, or ſpring, you may either raiſe them, or give them another cutting below the ſurface, then gently raiſing ſuch as are too thick, leaves the remainder, at proper diſtances, to ſtand another ſeaſon. This manner of cutting their roots, has, in a great meaſure, the ſame effect as tranſplanting.

Thoſe you have raiſed, as ſoon as you have ſmoothed their bruiſed and broken roots, and cut away ſome of the ſmall hairy fibres with a ſharp knife, plant in lines two feet aſunder, and nine or ten inches in the line; and if the ſoil is good, and the plants have grown vigorouſly, they ſhould not remain any longer than two years, but in poor land, they are to continue three.

Thoſe left in the drills where ſown, are, next autumn, or the following ſpring, to be treated in the ſame manner.

I muſt here obſerve a general error in the management of the Beech Tree at this age, which is, trimming off all their ſide-branches, and planting no more than the bare ſtem. This is doing the greateſt violence to theſe plants, and of which, they will not for ſeveral years get the better; no tree that I know of, admits leſs of being pruned when tranſplanted, particularly when young; as from it, (when executed with ſeverity) they become conſtantly hide-bound and ſtunted; therefore, none but very ill-placed branches (and even theſe ſparingly) are to be touched at this ſeaſon.

From this nurſery they muſt be removed to another, and planted in lines three and a half feet aſunder, and eighteen inches in the line, where they may remain, if in a good ſoil, for three years, but in poor land, four; obſerving always to prune but moderately at each removal, leaving abundance of ſmall branches to draw the ſap, for the increaſe of their trunks.

At this period, theſe plants will be fit for common and extenſive plantations; but ſuch as are deſigned for removal when large trees, they muſt undergo ſome further operations.

Theſe are to be removed to another nurſery, and planted in lines five feet aſunder, and two feet diſtance in the line, to remain in good ground three years, but in poor, four.

From this remove them again, and plant them eight feet aſunder line from line, and ſix feet in the line, to remain four years.

From this nurſery, if required of a larger ſize, remove them to the fields, planting them ten feet aſunder every way, to be ready for any future deſigns; and manage them as has been directed for the Elm.

It has been already obſerved, that no deciduous tree agrees worſe than this, with pruning at removal, to which may be added, wounding them, by cutting off large branches; the beſt method of treating them, is to reduce them to their proper form by regular prunings, while growing in the nurſery, particularly the ſeaſon before they are tranſplanted: This being regularly obſerved, and the earth kept in a proper degree of moiſture, they will not be ſenſibly retarded in their future growth.

The ſorts with variegated leaves, are propagated by budding them on the common kind.

This valuable tree, for lofty eſpaliers to keep gardens warm, or for hedge-rows to ſhelter barren fields, has hardly its equal, and, by retaining its leaves all winter, affords the ſame protection as an evergreen: It is therefore really amazing it is not more univerſally planted in the cold, bleak, and mountainous parts of the kingdom, where it will grow in the pooreſt, ſtony, ſandy, and gravelly grounds, and inſinuate its roots into places one would think impenetrable to any plant. It is, beſides, a tree of great beauty; and though the wood is not ſo valuable as that of ſome others, yet it is fitting for many uſeful purpoſes; and for fuel, it is the beſt of any wood we have in this climate.

CHAPTER III.

PLATANUS; or, The PLANE TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers growing ſeparate on the ſame tree. The male flowers are collected in a round ball; they have no petals, but have very ſmall empalements, which have oblong coloured ſtamina, terminated by four cornered ſummits. The female flowers have ſmall ſcaly empalements, and ſeveral ſmall concave petals, with ſeveral awl-ſhaped germin ſitting upon the ſtyles, crowned by recurved ſtigmas; theſe are collected in large balls. The germin afterwards turns to a roundiſh ſeed ſitting upon the briſtly ſtyle, and ſurrounded with downy hairs.

The SPECIES *are:*

1. The true ORIENTAL PLANE.
2. The Maple-leaved or SPANISH PLANE.
3. The Weſtern or VIRGINIAN PLANE.

THE firſt ſort is uſually raiſed from layers, though, where the ſeed can be had, the plants raiſed from it make the fineſt trees.

If to be propagated from layers, let them be laid down the beginning of March, and they will be ſufficiently rooted in a year.

If from ſeed let it be ſown the autumn it becomes ripe, in a moiſt rich ſoil, and ſhady ſituation, but not before it is dry. In the winter, cover the beds with peaſe-ſtraw, or rotten tanners bark, to be laid two or three inches deep, or ſome other light covering that can be eaſily removed in mild weather, to prevent the ground, (for want of air,) from contracting a muſtineſs, which might deſtroy the ſeed. In the following ſpring, before the ſeed vegetates, rake the beds gently over with a ſhort toothed rake, ſifting a little rich mould on them, and in proportion to what has been raked off; in dry weather, during the ſummer months, let them be regularly refreſhed with water. The following autumn, the beds having been made quite clean, and looſened with your finger, ſo as not to diſturb the plants, put a little more good mould about them with your hands, after this they will require no further trouble, but to keep them clean until they have another ſeaſon's growth; by which time, let them be removed to the nurſery the ſucceeding ſpring.

The ſecond ſort, though by many ranked as a diſtinct ſpecies, Mr Miller (and I believe juſtly) thinks only a ſeminal variety of the firſt; notwithſtanding the leaves are leſs divided, but more than the weſtern kind, and is eaſily increaſed by layers.

The third ſort grows freely from cuttings, which ought to be planted the beginning of March, in ſhady borders of rich moiſt earth, two feet line from line, and eight or ten inches in the line; and if they are torn aſunder at the joints, with a knob or ſome bur of the old wood, they will grow more readily, and ſooner become ſtrong plants, than otherwiſe. Theſe cuttings ought to be a foot or fourteen inches in length, buried about eight inches deep, and moderately watered till their ſhoots are two or three inches long, where they ſhould remain two years. The leaves of this kind are broader, and leſs indented than the other two; it is likewiſe hardier, grows faſter, and to a greater magnitude in this climate: So that in large plantations, or in expoſed ſituations, I would adviſe the greateſt number of them to be planted.

The ſeedlings, layers, and cuttings, are now all to be treated in the ſame manner, and planted out in the nurſery, in lines three feet and a half aſunder, and eighteen inches diſtant in the line: Let them get a plentiful watering at removal; cut away the extremities of their roots, with all ill-placed over-crowded branches, there to remain for three years.

From this remove them to another nurſery, and plant them in lines ſix feet aſunder, and three feet in the line, where they may ſtand ſix or ſeven years without removal, as this tree naturally produces abundance of roots with little culture. In this nurſery let the ground be annually dug, as for other plants, and the trees regularly pruned to the form you would have them: By attending to this, as ſoon as you have planted them out for good, your labour is almoſt over, as they will require little or no pruning ever after, but advance in a regular and beautiful manner, without the aſſiſtance of art.

The proper ſeaſon for tranſplanting this tree is in the month of March, and during the ſummer months, if the ſeaſon is dry, they ought to be plentifully watered, particularly if the ſoil is light and thin; for though this is a very hardy plant, yet, by removing them in autumn or winter, (ſhould the ſeaſon prove very ſevere,) the extremities of the preceding ſummer's ſhoot are ſometimes blaſted, which gives them an unpleaſing appearance the year following.

The *Platanus* will grow in any tolerable ſoil, but they naturally delight in a moiſt deep ground; therefore, when they are planted on that of an oppoſite quality, they ſhould be plentifully watered for ſeveral ſummers, which they will gratefully acknowledge, by the luxuriance of their growth.

This beautiful and magnificent tree is ſaid to have been firſt introduced into England by the great Lord Chancellor Bacon, who planted a great number of them at Verulam, near London, which were very flouriſhing a few years ſince. The great eſteem the ancient Perſians, Aſiatics, Greeks, and Romans, (who brought it from the Levant) had for it, is recorded by many hiſtorians, and that the ſalubrious emiſſions from the plantations they made near the city, protected them from the plague, and particularly at Iſpahan in Perſia, where it had for many centuries made dreadful ravages. The ſtory of Xerxes halting his army of ſeventeen hundred thouſand men for ſome days, when on his march to invade Greece, to admire the beauty and magnitude of one of theſe venerable Trees, is well known; as is that of the Romans moiſtening them with wine inſtead of water. But a relation at large of theſe, and other like circumſtances, would exceed our bounds, and be unneceſſary in a work of this kind: It is therefore ſufficient to obſerve, that the high eſteem in which theſe ancient nations held this noble tree, appears to me a ſtrong argument of their refined taſte and judgment; and I am concerned to ſay, that the neglect of its general culture in theſe kingdoms, is a reflection on ours. It affords the moſt impenetrable ſhade of any tree yet known; and as Pliny juſtly obſerves, there is none which ſo well defends us from the heat of the Sun in ſummer, or admits it more kindly in winter.

The Italians and Turks uſed formerly to build moſt of their ſhips with this timber; and they had them of ſo enormous a ſize, that whole canoes, and other veſſels for the ſea, have been excavated out of their prodigious trunks; it is hard, cloſe, takes a fine poliſh, and is valuable for a variety of uſeful purpoſes.

CHAPTER IV.

THE MAPLE TREE.

A Deſcription of its Flower and Seed.

The empalement of the flower is monopetalus, coloured, and cut into five ſharp ſegments at the brim, and is permanent. The corolla is compoſed of five oval petals which ſpread open, and are longer than the empalement. It hath eight ſhort awl-ſhaped ſtamina, crowned by ſimple ſummits. The germin is compreſſed, and immerſed in the large perforated receptacle. The ſtyle is ſlender. It hath two accuminated ſtigmas which are reflexed. The capſules are two, joined at their baſe; they are roundiſh, each being terminated by a large wing, incloſing one roundiſh ſeed in each.

The SPECIES *are:*

1. The greater MAPLE, in England falſely called the SYCAMORE, and in Scotland the PLANE TREE.
2. The Norway MAPLE, with Plane-tree leaves.
3. The Virginian Flowering MAPLE.
4. The American MAPLE, with Scarlet flowers.
5. The Virginian Aſh-leaved MAPLE.
6. The Common or Leſſer MAPLE.
7. The Greater MAPLE, with ſtriped leaves.
8. The Norway MAPLE, with ſtriped leaves.

THE two firſt mentioned being the largeſt growing and hardieſt trees, are of courſe moſt proper for extenſive plantations and expoſed ſituations; for which reaſon, I ſhall firſt direct their culture until of a conſiderable ſize, and then proceed to the other ſorts.

Their ſeed ripen in autumn, when it muſt be gathered in fair weather, and ſpread in an airy place until thoroughly dried, which it may be in about four or five weeks. The general practiſe is, to ſow them at this time; but, from long experience, I have found it better, and I have raiſed more, and finer plants, by mixing the ſeed with ſand, or looſe ſandy earth, kept defended from ſevere froſts, or much moiſture, until February, or the beginning of March, as the weather is more or leſs favourable: If not ſtraitened in land, ſow them in drills, as has been directed for the Beech, but thinner; or if otherwiſe, ſow them in beds only eighteen inches broad, with alleys of the ſame width, to be covered to the depth of about three quarters of an inch.

The following February or March, dig the alleys, and cut their roots to about five inches under the ſurface, which is eaſily performed with a ſharp ſpade; then draw out the largeſt plants where too thick, (which they muſt be, provided the ground is good, and has been properly dreſſed and kept clean); let theſe be planted in a good mellow ſoil, in drills cut out with the ſpade quite perpendicular, that the plants may ſtand upright; let the lines be eighteen inches aſunder, and the plants at eight or nine inches diſtance; and here they are to remain but one year, the ground being tolerably good.

In the following October, when the plants in general will be about two feet high; let theſe

that

that were tranſplanted, as well as the ſeedlings be raiſed; ſhorten their top-roots, cut off any croſs lateral branches, and remove them to another nurſery, where they ought to be planted in rows, two and a half feet aſunder, and fifteen inches in the row, to continue two years.

From hence remove them again, at the ſame ſeaſon, and plant them in rows five feet aſunder, and two and a half feet in the row, where they may continue four years.

Theſe, in an ordinary ſoil, will now be from twelve to fifteen feet high, and, if required of a larger ſize, for future purpoſes, they may be removed to any convenient ſituation, and planted eight or ten feet aſunder; when, any time after two, and not exceeding eight or ten years, they may be placed where deſigned to remain: And if, during that time, they have been carefully raiſed, ſkilfully pruned, and brought to their proper form, and moderately watered at planting, which, in a dry ſummer, may be neceſſary to repeat two or three times; when your labour with them is at an end.

I have directed both ſpring and autumnal planting for this and other trees; the reaſon for this is, that though the autumn is preferable for moſt of the deciduous kinds, when ſtrong and well-rooted, yet when young, before they have come to any tolerable height, they are apt to be injured by froſt, and forced out of the ground in ſevere ſeaſons.

The occaſion of ſo frequently removing theſe trees when young, is, that they naturally grow with downright carroty-roots, though, after undergoing the diſcipline here preſcribed, no plant roots better, or is more patient in being tranſplanted, and even when of a large ſize.

There is no tree, yet known in this climate, is ſo proper to be planted near the ſea, as the Great Maple, where I have known it grow luxuriantly, after many other kinds have been tried in vain; and, in a few years, their ſhelter will cheriſh and bring forward many other ſorts, which no art can otherwiſe effect.

This tree, however valuable, ſhould not be planted near the houſe, or by the ſides of walks that are intended to be kept in order; for their leaves exhales a ſweet clammy juce that entices great quantities of inſects, which eat them full of holes, and render them unſightly; beſides, they caſt their leaves very early in autumn, which putrify with the firſt moiſture, become offenſive, and render the walks both diſagreeable, and troubleſome to be kept clean.

I have not yet had an opportunity of planting the Norway Maple near the ſea, but, in many other ſituations, I have planted them in concert with the common large ſort, and found them equally hardy, and of as free a growth: They are a much handſomer tree, and their leaves have not the noxious qualities of the other.

The third, fourth, and fifth ſorts, are handſome trees, and proper for the wilderneſs, and other ornamental plantations, but ſhould not be planted ſingly, or in cold expoſed ſituations in this climate, as they commonly ſuffer much, both by the violence of the weſterly, and coldneſs of the north and eaſt winds. They may be propagated from ſeed as the other kinds are, but as it is not eaſily had in this country, we raiſe them from layers, from which they ſucceed well, when laid down in autumn or ſpring, and will be ſufficiently rooted in a year.

Having carefully raiſed your layers, and dreſſed them as uſually practiſed, plant them out in a quarter of good well-prepared ground, in rows, three feet aſunder, and a foot diſtance in the row; let them be watered, to ſettle the earth about their roots, and remain here two or three years, from whence remove them to where they are intended to remain for good.

The common or leſſer Maple, which produces abundance of ſeed with us, is eaſily propagated from it, in the ſame manner as the larger kind, and may be ſown in beds three and a half feet wide, according to the common practice, and, when two years old, let them be planted in the nurſery at two feet aſunder, there to be kept for two years more, when they will be fit for the purpoſes deſigned. This is a tree of humble growth, ſeldom riſing above twenty-five or thirty feet high, and therefore not generally uſed in large plantations of timber trees, but is very common in the hedge-rows over moſt parts of England.

The large ſtriped Maple, is commonly propagated by budding on the plain kind, and may alſo be raiſed from its own ſeed, many of which will be as finely variegated as the trees that produced them; a circumſtance very uncommon in other variegated plants, which rarely produce their own likeneſs.

The ſtriped Norway Maple, is alſo propagated by budding on the plain kind, and is a finely variegated tree, tho' I cannot ſay that the ſeed of them will produce variegated plants, never having been able certainly to procure them of the true kind, tho' I have frequently ſown them as ſuch ineffectually.

Of theſe trees, the firſt, ſecond, and ſixth ſorts particularly, will proſper in very indifferent, coarſe land, but moſt affect that which is deep and moiſt, tho' not wet or ſtiff; in ſuch places they will make a ſurpriſing progreſs, and in a few years become ſtately trees. The third, fourth, and fifth ſorts, delight moſt in a firm dry mould.

The various uſes of this tree to the turner for houſehold convenience, as well as to the joiner for tables, *&c.* are too generally known to require being particularly mentioned; but the timber of the common leſſer Maple, is much the beſt for general uſe.

CHAPTER V.

THE OAK TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers on the ſame tree; the male flowers are diſpoſed in a looſe catkin; theſe have an empalement of one leaf, divided into four or five ſegments; they have no petals, but many ſhort ſtamina, terminated by large twin ſummits. The female flowers which ſit cloſe to the buds, have a hemiſpherical thick empalement of one leaf, which is rough and entire, almoſt hiding the flower, which has no petal, but a ſmall oval germin, ſupporting a ſingle five pointed ſtyle, crowned by ſingle permanent ſtigmas. The germin afterward becomes an oval nut (or acorn) with a thick cover, having one cell, whoſe baſe is fixed into the empalement or cup.

The SPECIES *are:*

1. The common OAK.
2. The broad-leaved OAK.
3. The Virginian Scarlet OAK.
4. The Virginian OAK, with cheſnut leaves.
5. The black Maryland OAK.
6. The white OAK of Carolina.
7. The OAK with woolly leaves.
8. The Cheſnut-leaved Eaſtern OAK, with a thick ſcaley cup.
9. The broad-leaved Eaſtern OAK, whoſe leaves are finely cut, with a large acorn, and hairy cup.
10. The Champion Cheſnut OAK.
11. The red Maryland OAK.

12. The willow-leaved Maryland OAK.
13. The Burgundy OAK.
14. The gall-bearing OAK.
15. The cut-leaved Spaniſh OAK.
16. The ſwamp Spaniſh OAK.
17. The ſtriped OAK.

THERE are many other kinds of Oaks mentioned in the catalogues of different writers on botany and gardening, but theſe I have here ſelected, I have found, from experience, the moſt diſtinct ſpecies, and fineſt trees of that tribe; many of the others being no way remarkable for beauty, and ſome of them no other than ſeminal variations: I therefore thought it unneceſſary to enumerate more, as all the other ſorts may be propagated in the manner I have directed.

The ſix ſorts firſt mentioned are trees of the largeſt growth, and therefore ſhould be planted where ſuch are required; the others, being of more humble ſtature, may be confined to the wilderneſs, or ſmaller deſigns: But as the wood of the common Engliſh Oak is preferable to any other yet known, the foreign kinds ſhould only be propagated, for ornamental purpoſes, until their virtues are better known.

This tree is uſually planted out for good when very young, from a general belief, that it will not ſucceed in that operation, if ſuffered to come to any conſiderable age; and indeed, from the common methods of its culture, the obſervation is very juſtly founded: But by following better rules, which I ſhall here endeavour to give, and which are the reſult of a very conſiderable practice, it will be found to tranſplant with certain ſucceſs, when of a large ſize.

No tree requires more attention to make a handſome well-proportioned free-growing plant, than the Oak; and none is more neglected, however worthy our attention. It is rare to ſee a ſtraight uniform plantation of them, but where they are crowded very thick together, or drawn up by the ſhelter of other trees.

The common method of raiſing Oaks, is by ſowing them in beds very thick, to ſtand two years, and ſometimes three. They are naturally carrot-rooted, running ſtraight down into the earth, with few, and ſometimes not any fibres; and by remaining in this ſituation for ſome time, they are drawn up very tall and ſlender, their roots becoming hard and woody, which when cut, to a proper length, (which they muſt be) this operation is ſo very violent, that many of the plants fail, while the remainder are retarded in their growth ſeveral years, or perhaps become ſtunted, croſs-growing, and ſhrubby: But, to remedy theſe evils, purſue the following ſyſtem, collected from obſervation, and in which I have been long ſucceſsful, rearing many beautiful, ſtraight, and well-proportioned Oaks.

As ſoon as you are provided with acorns, which are to be gathered in autumn in fair weather, and from the handſomeſt and moſt vigorous trees, let them be ſpread in an airy covered place, and frequently turned until quite dry; then to be mixed with ſand, or looſe light earth; be careful to protect them from vermin, froſt, and moiſture, until about the middle of February.

The autumn before you intend to plant your acorns, let a ſpot of good natural ſoil be well dug and trenched, in order to meliorate by the winter's froſts, &c. which muſt be again dug the following ſpring, then to be raked and levelled; and, in order to have the crop equal and uniform, try the goodneſs of your ſeeds, by throwing them into a tub of water, when the ſound will ſink to the bottom, and the rotten or decayed float on the ſurface. The quality of the acorns being thus aſcertained, make ſhallow drills acroſs the ground, with a ſmall hoe, at eighteen or twenty inches diſtance; and in theſe drop your acorns, about two inches ſeparate one from the other, covering them, with the back of a rake, to the depth of two inches; the ground is to be raked ſmooth, and kept clean and mellow during the ſummer months.

The beginning of the following April, cut them under the ſurface as directed for the Beech, there to remain until the next ſpring.

From this ſituation, as ſoon as their buds begin to ſwell, let them be carefully raiſed, without injuring their roots or fibres; and as ſoon as the ground is made ready, ſeparate the ſtraight free-growing plants from the crooked and ſhrubby; ſhorten their downright or bruiſed roots, but be very ſparing of the ſmall fibres; when the favourable plants are to be put into one quarter of the nurſery, in rows, two feet aſunder, and nine inches in the row; and the others into another, at the ſame diſtances: Let theſe plants be as little time as poſſible out of the ground; for this purpoſe, raiſe few of them at a time, but where there are a number of hands, I would adviſe four to be ſelected for the purpoſe; one to be employed to raiſe the plants, another to prune them for the two that are appointed to plant; by this expedient the neceſſary diſpatch will be made; and ſhould the ground be at a diſtance, I would have the plants laid on an hand-barrow, that the earth adhering to the ſmall fibres may be retained, but obſerve not to raiſe more than can be expeditiouſly ſet down, as already directed.

Where the land is good, and the ſeaſons turn out favourably, the ſtraight plants may be removed in two years; but when either of theſe circumſtances happen otherwiſe, they muſt continue to the third ſeaſon.

The crooked and bruſhy trees, having ſtood two years in the nurſery, they muſt be cut down to the ground, to remain two years longer; and obſerve, that, as ſoon as their ſhoots are four or five inches high, to pinch off all but the moſt promiſing; from whence the whole ſtrength and juices of the root will be exerted in ſupport of this ſingle ſhoot.

Another method of raiſing theſe trees, with equal ſucceſs, is, to ſow the acorns on beds, in rows, ſeven or eight inches aſunder, and two or three inches in the row, covering them to the uſual depth, there to remain one year.

Obſerve that the beds have been as carefully prepared, as the ground planted in the drill way.

From theſe beds let them be removed the following ſpring, and having ſhortened their top-roots, lay them in lines, cut perpendicular with the ſpade, eighteen inches aſunder, and eight or nine inches in the line, where they are to continue two years.

From hence remove them, ſeparating, (as has been directed in the foregoing culture,) the ſtraight from the crooked, to be planted in different quarters, in rows, two feet and a half aſunder, and one foot diſtance in the row; where they are to be kept for three years, and the crooked, if they have grown freely, are to be cut down in one, but if otherwiſe, not until after two years; to remain three years after being cut down.

Many writers of reputation, direct ſowing the acorns, as ſoon as thoroughly dry, (which will be ſome time in October or November) for their vegetation is ſo ſtrong that they are apt to ſhoot ſoon after they are gathered, (tho' not in the ground) and ſo become unfruitful. But I have found, from innumerable inſtances, the method I have directed will produce better-rooted and cleaner plants; that is, to prepare the ſoil the autumn before planting, as already directed, and not immediately when you plant, as from that imperfect culture, the ſurface of the beds will ſoon become hard and impenetrable by the winter rains. The vegetation of the acorns before ſowing, will be preſerved by the ſand or looſe earth; when any advance they may make before February, will not impede their vegetation, but, on the contrary, forward their future growth, provided care has been taken, to protect the acorns from moiſture when mixed with the ſand, &c.

This tree, having been managed as here directed, will now be of a proper age and ſize for removing to the plantation for good, and, from the abundance of their roots, and good proportion of their bodies, will reſiſt the moſt violent winds; but ſuch as incline to provide large trees of the common Engliſh Oak, for future purpoſes, muſt proceed yet farther, and as I ſhall here direct.

Having made choice of a good mellow piece of ground, that had been well dug the preceding autumn; about the end of March, or beginning of April, let it be again dug and well levelled, clearing off all ſtones and weeds. As ſoon as the buds of the plants begin to ſwell, raiſe ſuch (which ought to be the ſtraighteſt and fineſt) as you intend to further cultivate, and improve in the nurſery; continue to ſhorten ſuch roots as tend downwards, and to ſmooth ſuch ſpreading fibres as are too long, or have been wounded with the ſpade in raiſing; and where there are an over abundance of fibres, you may alſo cut away ſome of the ſmalleſt, which, ſhould the trees not be immediately planted, will decay, and ſometimes bring on a mouldineſs about the principal roots, which might prove very prejudicial to their growing: You muſt now cut away all ill-placed croſs branches from their ſtems, leaving only a few of the ſmaller, at proper intervals, to detain the ſap, for its greater augmentation; be careful that the buds of any of the ſhoots are not injured, as they are difficult to be repaired in this tree, in any other way than by cutting it down. Let the operations reſpecting this tree be done in the very gentleſt manner, not ſhaking the plants, that they may take to their new ſituation, as much of the original earth as poſſible.

The trees being now properly prepared, plant them in lines, five feet aſunder, and two feet and a half in the line; give them a plentiful watering, to ſettle the earth to their roots; which muſt be repeated once a fortnight for three or four times, (ſhould the ſeaſon prove dry) as it will much promote their growth. In this nurſery they are to remain no longer than four years, provided the ſoil is good and generous, but if poor and hungry, five or ſix: Let the ground be annually dug between the lines, and the trees pruned every ſpring, with the ſame care and attention as at removing. I cannot quit the article of pruning, without firſt obſerving, that no circumſtance is attended with worſe conſequences to planters in general, than the neglect of timely and regular pruning their trees while young; and what muſt render it quite inexcuſable, is, that even in extenſive plantations, the expence muſt be but trifling, when only annually performed. The cutting of young and tender branches, can have no ill effect, either on the life or growth of the tree; but wounds made by lopping off old wood, much weakens, and often produces a gangrene that proves mortal; in ſome kinds it occaſions an exceſſive bleeding; and in others, by imbibing too much moiſture, occaſions an unnatural extention of the veſſels in the trees, by which they burſt, which occaſion their death. Theſe are truths founded on nature, reaſon and experience, and which ought to warn all planters to a due performance of this operation, as, from the judicious practice, joined to the other articles of culture, the plants are not only preſerved in a healthful free growing ſtate, but may be formed to any ſhape or proportion, their nature will admit of; which if but neglected a few years, no future diſcipline can be expected to form fine trees. But ſhould your

Oaks become rude by neglect, the beſt ſeaſon of cutting their large branches is in March; but for the young and tender, any time from autumn until ſpring.

The trees from this culture, will by this time be finely rooted, ſtraight, and from ten to twelve feet high, and well proportioned; though but in an ordinary ſoil and ſituation, provided when firſt removed from the ſeed bed, they have been collected from the moſt favourable plants.

But to render them proper for tranſplanting of a larger ſize, remove them again to any convenient ſpot of tolerable ground, managing the roots as before directed; and plant them in lines, eight feet aſunder, and ſix feet in the line, watering them plentifully at planting; where they may continue ſix or ſeven years, by which time they will be about twenty feet high.

Should it be neceſſary to make a reſerve of large trees; remove them once more, and plant them twelve feet aſunder; giving them an abundant watering at planting, and repeat it three or four times, more or leſs as the ſeaſon may require. In this ſituation they may continue, for eight or ten years, for any new deſign that may require them, when, by a careful removal, and four or five plentiful waterings the firſt and ſecond ſummer, they will grow as luxuriantly as if they had been planted in the ſame ſoil, from the ſmalleſt ſize, and arrive full as early to maturity, with this advantage, that the trees, from the regular and timely pruning they have had, muſt of courſe be formed to their proper ſhape, and will in future give little or no trouble.

Though moſt of the deciduous trees, particularly the large kinds, ſucceed beſt, when planted in autumn, yet the Oak is one exception to this general rule, as it has been found to tranſplant with more ſafety, and to grow more freely, when moved in the ſpring; therefore in this ſeaſon it ſhould be executed, whether in wet, or even in ſwampy lands, and I have often known large plantations to fail entirely by an autumnal, or winter planting.

This noble tree, the monarch of the woods, the boaſt and bulwark of the Britiſh nation, will grow freely in a great variety of ſoils, and might be propagated in the waſtes, appropriated to the rearing of trees of the indifferent kinds, or even to leſs valuable purpoſes. This I have experienced from attending to its nature and properties; for though, like moſt other trees, it at firſt affects a ſound deep mould, yet it will, notwithſtanding, proſper exceedingly on the coarſeſt moiſt gravel, loam and ſand, or ſtiff heavy clay and till (which moſt other trees abhor), and that too when the ſoil has been ſo ſteril and hungry as not to afford grazing for ſheep.

The ſtriped Oak, is propagated by budding or grafting on the common kind, and is beautifully variegated, which I have much improved, both in the brightneſs of its colours, and ſize of the leaf, by joining it to the ſcarlet Virginian, and cheſnut-leaved kinds.

The tenderer ſorts of Oaks will be rendered more hardy, and the dwarf kinds improved in ſize, by grafting and budding them on the common ſort; and is the moſt unexceptionable practice, to procure the different ſpecies of this fine tree, in its greateſt perfection and beauty.

The value and uſes of the wood of this tree, are ſo univerſally known, that it would be an inſult on the underſtanding, to employ time in pointing them out.

You have been juſt directed to cut away all ill-placed and croſs branches, leaving only a few of the ſmaller, at proper intervals, in order to raiſe the ſap, for a greater encreaſe of the trunk; while this is doing, give me leave to obſerve, that, you muſt be careful that the branches are not ſo numerous, as to retard the ſpreading of the encreaſe of the root, (through which life and vigour is conveyed) by too great an aſcending attraction of the ſap; in this proportion and no other, can we pretend to excellerate the works of nature, which are ſupported by an harmony, we can only attempt to follow. This obſervation ſhould ever influence our conduct, not more in the line for which this treatiſe is purpoſely written to advance, than in any other of nature's works.

In the proper uſe of the knife, conſiſts the formation of our trees, and giving an encreaſe of growth, where a deficiency is found, whether in the *ſtem*, *branch*, or *root*.

As ſometimes the practiſe of dibbling, is uſed for tranſplanting, and even of trees; I do by no means allow of it, and againſt which ſuch a number of objections can be brought, that I am ſatisfied it is unneceſſary to point them out, in a treatiſe deſigned for perſons of diſcernment, and liberal principles, who would by no means countenance a practice, which would aſſiſt in continuing a ſlovenly manner of doing work, which I would gladly baniſh. I have found this practice unfavourable even in planting *Cabbages*, *Colly-flowers*, *Potatoes*, &c. therefore would recommend univerſally, the uſe of the *ſpade*, and for ſmall articles, the *trowel.*

An Account of a new Species of the OAK, in a Letter from obn Zephaniah Holwell, Eſq; F. R. S. from the Philoſophical Tranſactions, 1773.

ABOUT ſeven years ſince, Mr. Lucombe of St. Thomas, near Exeter, ſowed a parcel of acorns, ſaved from a tree of his own growth, of the iron or wainſcot ſpecies When they came up, he obſerved one amongſt them that kept its leaves throughout the winter. Struck with the phænomenon, he cheriſhed, and paid particular attention to it; he propagated it, by grafting ſome thouſands from it, which I had the pleaſure of ſeeing, eight days ago, in high flouriſhing beauty and verdure, notwithſtanding the ſeverity of the winter. Its growth is ſtraight, and handſome as fir; its leaves evergreen; and the wood is thought, by the beſt judges, in hardneſs and ſtrength to exeeed all other oaks. It makes but one ſhoot in the year, viz. in May, and continues growing without intermiſſion: whereas other Oaks ſhoot twice, namely, in May and in Auguſt. But the peculiar and ineſtimable part of its character is, the amazing quickneſs of its growth, which I imagine may be attributed (in ſome degree at leaſt) to its making but one ſhoot in the year; for I believe all trees that ſhoot twice are ſome time at reſt before they make the ſecond.

I had the curioſity to take the dimenſions of the parent tree, (ſeven years old) and ſome of the grafts: the firſt meaſured twenty-one feet high, and full twenty inches in the girt; a graft of four years old ſixteen feet high, and full fourteen inches in the girt: the firſt he grafted is ſix years old, and has outſhot its parent two feet in height. The parent-tree ſeems to promiſe acorns ſoon, has bloſſomed, and forms its foot-ſtalks ſtrong, and the cup upon the foot-ſtalk with the appearance of the acorn, which, with a little more age, will ſwell to perfection.

This Oak is diſtinguiſhed in this country by the title of the Lucombe Oak. Its ſhoots in general are from four to five feet every year; ſo that it will, in the ſpace of thirty or forty years, out-grow in altitude and girt the common Oak of an hundred. I have a walking-pole full five feet long, a ſide ſhoot from one of the grafts, only a year and a half old. From the ſimilarity of the leaves of this Oak to thoſe of the iron or wainſcot Oak, it appears to be a deſcendant from that ſpecies, though it differs from it in every other particular. Several gentlemen round this neighbourhood, and in the adjoining counties of Cornwall and Somerſet, have planted them, and they are found to flouriſh in very different ſoils.

CHAPTER VI.

THE ASH TREE.

Deſcription of its Flower and Seed.

It hath hermaphrodite and female flowers on the ſame tree, and ſometimes on different trees. The hermaphrodite flowers have no petals, but a ſmall four-pointed empalement, including two erect ſtamina, which are terminated by oblong ſummits, having four furrows. In the centre is ſituated an oval compreſſed germin, ſupporting a cylindrical ſtyle, crowned by a bifid ſtigma. The germin afterwards becomes a compreſſed bordered fuit, ſhaped like a bird's tongue, having one cell, incloſing a ſeed of the ſame form. The female flowers are the ſame, but have no ſtamina.

The SPECIES *are:*

1. The common ASH.
2. The Manna ASH.
3. The Virginian flowering ASH.
4. The New-England ASH, with ſharp-pointed leaves.
5. The Carolina ASH.
6. The white American ASH.
7. The black American ASH.
8. The red American ASH.
9. The white flowering ASH.
10. The ASH with ſtriped leaves.

HAVING gathered the keys of the common Aſh about the beginning of November, from handſome vigorous trees, as ſoon as the weather is fair, ſpread them on an airy loft or covered place, turning them frequently until quite dry, which, they will be in three or four weeks, in a proper ſituation; then mix them with ſome looſe ſandy earth, protecting them from wet until the following ſpring, when they are to be ſown about the beginning of April, on a well-prepared freſh mellow ſoil, in beds of three and a half feet broad, with alleys between the beds, of eighteen inches, and covered to the depth of three quarters of an inch. The ſeed will not appear until the ſucceeding ſpring, during which time the beds muſt be kept quite clean, and as looſe and little poached as poſſible; in February, before the ſeed begin to ſpring, let the ſurface of the ground be gently raked over, removing all muſty and foggy particles they may have contracted during the winter, throwing a little freſh rich mould over them, to replace what you have taken away, which will much promote the future growth of the plants. In this ſeminary, the trees are to remain only one year.

Having in the following *February* or *March*, prepared another quarter of good ground in the nurſery, in the ſame manner as for the ſeed, remove them into it with as much expedition as poſſible, to prevent their ſmall fibres from withering, cutting away no more than the downright top roots; then lay them in drills, cut down perpendicular with the ſpade; let theſe drills be eighteen or twenty inches aſunder, and the plants at eight or nine inches in the drill; give them a gentle watering at planting, and continue it three or four times, at proper intervals, as the weather may require, giving them a proper culture, for two ſeaſons.

In October, as ſoon as their leaves are diſcoloured, remove them from this nurſery; into another quarter of tolerable ground, placing them out in lines, three feet and a half aſunder, and fifteen or ſixteen inches in the line, where they may remain three years, obſerving to dig the ground between the lines every ſpring; but before you put them down, obſerve to cut off cloſe to the ſtem, all ſtrong and ill placed ſhoots, leaving a ſufficient number of ſmall branches, to attract and detain the ſap for augmenting the trunk.

At the end of three years, you will find your trees about ſeven or eight feet high, ſtrong, well-rooted, and of a proper ſize for extenſive plantations; but where a ſucceſſion of large trees are wanted, remove them every fourth year, pruning their roots and bodies as before directed, watering them at planting, and three or four times more, in dry ſeaſons, at about twelve or fourteen days diſtance, giving them greater intervals in proportion to their ſize, as directed for the Elm, which if you follow, they may be removed at any ſize you chuſe, without any ſenſible check to their growth.

All the other kinds are propagated by budding them on the common Aſh, which being a large-growing hardy tree, will be a conſiderable improvement to the dwarfiſh and tenderer ſorts.

The Aſh ought neither to be planted in gardens, or near other trees, nor in any mixed plantation. There is no plant I remember, that ſo ſoon, and ſo much exhauſts the virtues of the ſoil; and their ſhade is malignant to every production of the earth, being a meer ſtep dame to other trees: Let them be planted together, where notwithſtanding theſe unfriendly qualities, if properly managed, they will yield great returs to the owner in a few years.

This tree will grow in very ſteril and barren ſoil, and in the blakeſt and moſt expoſed ſituations; but in a deep mould, though of no generous quality, if but free from ſtanding water, it will arrive quickly to a great ſize.

The wood of the Aſh (next to that of the Oak) is of the moſt univerſal uſe, particularly for all the implements of huſbandry. It has alſo this ſingular advantage, that, when young, it is as ſtrong and laſting a timber as when old; but the value, and particular uſes of it, being ſo univerſally known, renders it unneceſſary to be more particular.

Before I diſmiſs this uſeful tree, give me leave to relate an experiment I made, in the early part of life, as it is much in its favour. In order to furniſh myſelf with poles for eſpaliers and dead fences, I planted a number of them in copſes, for which purpoſe they anſwered very well, and gave great abundance.

For this purpoſe, in a very obſtinate heavy meadow ground, I planted to the extent of half a rood, or the eighth part of an acre, with Aſh trees ſix years old, and about eight feet high. I placed them in rows, four feet aſunder, and two feet diſtance in the row, where I let them remain untouched, only digging the ground about them every autumn, for four years, when I cut them down to about five or ſix inches above ground for the purpoſes juſt mentioned, which they fully anſwered my expectations, reſerving twenty of the faireſt plants, at proper diſtances, for trees.

I continued to dig the ground two years longer, and then left them to nature for five years more, that is, ſeven from being firſt cut down. Having more of them than anſwered my purpoſe, or that I could expect from ſo ſmall a ſpot of ground, I meaſured off one half, and ſold them for pollards and hoops, for which I got forty ſhillings.

I cut them again in ſix years, when they were ſtronger than at firſt, I ſold them for fifty ſhillings.

In the following ſix years, I again cut them down, and though theſe were much the largeſt ſhoots, I ſold them as before.

There now remained twenty trees on the ground, which I intended to ſtand for timber, ten of which grew amongſt the copſe I had ſold. My intention was not to cut them until the decline of my life, that I might leave to poſterity what obſervations I was able to make, of the profit a man who begins to plant when young, may reap from it in his own time: But ſome untoward events cut ſhort my deſign, and I was obliged to fell them at twenty-three years growth, at ſeven ſhillings a tree, which was L. 3:10 s. for the ten trees on the copſe ground, I had cut and ſold three times before.

Thus it appears, that an acre of indifferent land (for mine was very bad) planted with Aſh trees in the manner deſcribed, yielded in twenty-three years, L. 115: 10 s. without any other expence than digging the ground for the firſt five or ſix years, and cutting the copſe down for ſale, which muſt be very trifling, yet neceſſary to be done with care in this manner: Let them be cut ſlanting, with ſharp inſtruments, leaving all the wounds ſmooth and clean, to prevent the wet from lodging in the ſtocks, as from hence it might communicate to the roots, and contaminate the whole plant; this work a common purchaſer of the copſe would probably pay little attention to, but leave them in ſuch a rude unſeemly ſtate, as might be as unpleaſing to the ſight as dangerous to their future growth. The beſt ſeaſon for this work, is the month of February, before the ſap begins to riſe. I have not mentioned any price for the firſt cutting, having uſed them myſelf: Theſe were planted at eight feet high, and had ſtood four years from planting, ſo that, from the loweſt calculation, they muſt have been worth more than paid the whole expence of labour: To which I muſt add, that, after ſelling the laſt cutting of my copſe, I was informed by a friend who was a judge of their value, that I had been groſsly deceived by the purchaſer, and that I ſhould have received one-third more than I did.

It is neceſſary to obſerve, for the benefit of ſuch as incline to follow this practice, which may be worth the attention of ſuch, whoſe ſituation it may ſuit, that, after the ſecond cutting, I found I had planted my copſe too thick, and that, had they been at greater diſtances, I ſhould have reaped a conſiderably greater advantage from them: I therefore, from experience adviſe them to be planted in rows, ſix feet aſunder, and three feet in the row.

CHAPTER VII.

The LIME TREE.

A Deſcription of its Flower and Seed.

The flowers have a concave coloured empalement, which is cut into five part; it has five oblong blunt petals which are crenated at their points, and many awl-ſhaped ſtamina terminated by ſingle ſummits with a roundiſh germin, ſupporting a ſlender ſtyle the length of the ſtamina, crowned by an obtuſe five cornered ſtigma. The germin afterwards becomes a thick globular capſule with five cells, opening at the baſe with five valves, each containing one roundiſh ſeed.

The SPECIES *are:*

1. The broad-leaved flowering LIME TREE.
2. The red-twigged LIME TREE.
3. The green twigged LIME TREE.
4. The ſmall leaved LIME TREE, of a tawney green colour both in the leaf and bark.
5. The ſtriped-leaved LIME Tree.

THE firſt mentioned is the fineſt plant of the ſpecies: The ſecond is next to be preferred; it has alſo large leaves, grows to be a ſtately tree, and the ſhining deep red colour of its bark has a chearful and agreeable effect in winter. The third and fourth ſorts are much inferior in beauty; and grow in a looſe ſtraggling manner, nor ever make ſo ſtraight or ſo lofty trees; they are therefore unworthy of propagation, in compariſon of the two firſt; nor would I have mentioned them, but to warn the planters to beware of this ſpecies, with which the nurſeries generally abound, and which, not being ſufficiently known to nurſerymen, may be indiſcriminately raiſed with the others, which if placed by the ſides of walks, or in the ſtraight lines of avenues, muſt from the irregularity of their form, and difference of growth, very much deface ſuch plantations.

The Lime tree may be propagated by ſeed, which ripens about the end of October, and when quite dry, ſhould be mixed with ſand, and protected from froſt and rain, until the beginning of March; when they ought to be ſown in a ſhady border of rich, moiſt, loamy ſoil, in beds three and a half feet wide, with alleys of eighteen inches, and covered to the depth of three quarters of an inch. When the ſeedlings begin to peep, let them be frequently watered, and increaſe the quantity as the plants advance: Let the beds, in autumn and ſpring, be managed as directed for other hardy ſeedling trees; and here let them continue two years.

The plants, raiſed from ſeed, make very little progreſs for three or four years; and as they may be readily raiſed from layers, which will ſave much time, and make equally good plants. I would adviſe this practice as the beſt method and moſt ready for furniſhing plantations.

Therefore, being provided with ſtools, or mother-plants, as directed for the Engliſh Elm, and planted at the ſame diſtances, lay down their branches any time from September until April; only obſerve, that the plants laid down in autumn, will be better rooted, and have ſtronger ſhoots than thoſe laid down in the ſpring.

A quarter of generous freſh ground being well prepared, about the middle of October take up your layers very carefully, without tearing or bruiſing their fibres; ſhorten their roots moderately, and cut away ſuch as croſs each other: Should the layers be plentifully rooted, and thick-bodied in proportion to their height, ſo as not to be in danger of being diſplaced by the wind, they may be planted without topping; but ſuch as are too ſlender for their growth, muſt be cut down, from ſix inches to a foot, more or leſs in proportion to the quantity of their fibres; plant them in lines three feet aſunder, and fifteen inches diſtance in the line, giving the ground the uſual culture of hoeing and digging as for other trees; and here let them remain three years; but obſerve to plant ſuch as are not cut down, ſeparate from the others, which will not only be more ornamental, but they will better protect each other from their equality of height.

From hence remove them, at the ſame ſeaſon as formerly, to another quarter of ſtout ground, dreſſing their roots, and pruning their bodies, as directed for the Engliſh Elm, and plant them in lines, five feet aſunder, and two feet in the lines; repeat the proper pruning in February every ſeaſon, and alſo in ſpring and autumn give them the uſual dreſſings; and, in this ſituation, they are to continue four years.

They are again to be removed into another nurſery, obſerving to keep them in good deep ground, and plant them in lines, ſeven feet aſunder, and three feet in the line, giving them the neceſſary annual pruning, and digging the ground between them; where they are to remain four years, and no longer.

By this time the trees, being eleven years old, will in general be above twenty feet high; provided the ſoil has even been but middling, and the culture given them that has been directed, but as a ſucceſſion of large trees, that may be moved with ſafety, will always be wanting to gentlemen poſſeſſed of land, and lovers of improvement, as well as others, I adviſe, a number of theſe to be removed into another nurſery, planting them at ten feet aſunder, cropping the ground with ſuch kitchen herbs as are beſt ſuited to the ſoil, which will pay both rent and labour; here the trees are to remain five or ſix years; by which time they will be from thirty to thirty-five feet high, and will ſucceed after removal, as well as the ſmalleſt plant, by giving them three or four plentiful waterings in dry weather, the firſt, and ſecond ſeaſon, provided there is a continued drought.

The Lime moſtly delights in a rich-feeding loamy ſoil, but will grow freely in any tolerable land, of a competent depth, though coarſe and heavy; they will alſo grow in ſandy and gravelly land, but not with the ſame beauty or advantage, as, in ſuch ſituations, their leaves, in dry ſeaſons, are often infeſted with inſects, and decay early in the autumn; therefore, in a thin hungry ſoil, they ought not to be planted in great numbers, though a few of them may contribute to a pleaſing variety.

The timber of the Lime tree, is much more preferable than any kind of the Willow, being ſtronger, and yet lighter; it is uſed by the carver, by architects for framing the models of their buildings, and by the turner for making bowls, diſhes, &c. I am likewiſe aſſured, it is very proper for lining of rooms, and that, when painted, it will laſt long.

This graceful and magnificent tree, the greateſt ornament of the Britiſh gardens and villas, and pride of planters in the laſt, and great part of the preſent century, is now in leſs eſteem than formerly, though for what reaſon I cannot eaſily account, as it has more good properties, the value of the timber excepted, and that too, far from being uſeleſs, than moſt trees I know. It produces a large, tall, upright body, ſmooth ſhining bark, ample leaf, a goodly and extenſive ſhade, healthful odoriferous bloſſoms, is admirable food for bees, reſiſts the winds, bears lopping off large branches without injury, ſoon heals of its ſcars and wounds, continues ſound to a great age, and, of all the trees yet known, (the Engliſh Elm excepted,) makes the fineſt, loftieſt, and quickeſt paliſade hedges.

I ſay then, from what cauſes this tree has fallen into diſeſteem, is to me ſurpriſing. It were preſumptuous and inſolent in me, to arraign the taſte and judgment of the numerous, learned, and reſpectable body of planters in Great Britain; nor am I either weak or vain enough to make ſuch an attempt, but I cannot help doing what I think juſtice to this plant. I have argued with many of them, in defence of its beauty and utility in various reſpects; the beauty of the tree I have never heard diſputed, nor ever found the arguments againſt it to go further, than the defect of caſting its leaves in autumn; but this only happens from their being planted in poor, thin, or hot ſoil, which they diſlike, and which, being frequently practiſed, I preſume is the principal occaſion for their falling into diſcredit; but as the ſpirit of improving is now encreaſing, I hope ſtill to live to ſee the Lime again reaſſume its former rank and character.

CHAPTER VIII.

THE HORNBEAM TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers, growing ſeparate on the ſame plant. The male flowers are diſpoſed in a cylindrical rope or catkin, which is looſe and ſcaly, each ſcale covering one flower, which hath no petals, but ten ſmall ſtamina, terminated by compreſſed hairy ſummits. The female flowers are diſpoſed in the ſame form, and are ſingle under each ſcale; theſe have one petal, which is ſhaped like a cup, cut into ſix parts, and two ſhort germins, each having two hairy ſtyles, crowned by a ſingle ſtigma. The catkin afterward grows large, and at the baſe of each ſcale is lodged an oval angular nut.

The SPECIES *are:*

1. The common HORNBEAM.
2. The Hop HORNBEAM.
3. The Virginian Flowering HORNBEAM.
4. The ſtriped HORNBEAM.

THE common Hornbeam ſhould be propagated by ſeed, which is ripe in autumn, and ſhould be ſpread on a loft until dry, and then mixed with ſand to preſerve them, until the following ſpring, when they may be ſown thin on beds of freſh earth, three and a half feet broad, with alleys eighteen inches wide between the beds, and covered to the depth of three quarters of an inch. This ſeed will remain a year in the ground before the plants appear; during which time, the earth muſt be kept clean and mellow. In the following February, looſen the ſurface of the beds with a ſhort-toothed rake, ſo as not to diſturb the ſeed, and throw a gentle covering of freſh mould over them; where they are to remain for two years, if not too thick as the plants make but a ſlow progreſs the firſt ſeaſon, and are naturally well-rooted.

From the ſeed-bed remove them early in October, or as ſoon after as the weather will permit, into any freſh ſpot of ground in the nurſery you can beſt ſpare, though of an indifferent quality; reduce the ſuperfluous roots, cutting away ſuch as croſs one another, and plant them in rows, two feet and a half aſunder, and a foot diſtance in the row; to remain three years, annually digging the ground between the rows.

By this time the plants will be of ſufficient growth for hedges, where immediate ſhelter is not required, or for woods, to be mixed with other young trees; but where you intend at once to have the advantages of warmth and ornament, a little more labour is required.

Therefore, where you deſire to have Hornbeam hedges planted at ſeven or eight feet high, remove them from the former nurſery to another, and place them in rows, ten feet aſunder row from row, and five feet diſtance in the row, training them annually in the regular hedge form, but obſerve to keep them light and thin in the top, when, after four years ſtanding, they may be planted out where they are deſigned to remain, making complete hedges, for they will have ſuch abundance of roots as to defy the ſtrongeſt winds, and require no further expence or trouble than two or three plentiful waterings, and keeping their roots clean for three or four years.

The ſtraighteſt plants intended for trees, may, at raiſing them from the firſt nurſery, be ſeparated from thoſe for hedges, and planted in rows, five feet aſunder, and two feet diſtant in the row; let them be annually pruned to their proper form, and from hence they may be removed after three or four years, to the places where they are intended to remain.

The ſecond and third ſorts are eaſily increaſed from layers, and make an agreeable variety in the wilderneſs, with other trees.

The ſtriped kind is propagated by budding on the common, but the colours are not ſtrong or lively.

Though I am not an advocate for the Hornbeam tree in ornamental plantations, or in generous ſoils and ſheltered ſituations, yet from its being one of the hardieſt trees known, the many good qualities of its wood, and the ſudden ſhelter it affords when formed into hedges, gives it ſome claim to our attention, particularly in all cold and expoſed ſituations.

It will grow ſurpriſingly on the coldeſt hills, and in the ſtiffeſt, barren, and moſt worthleſs ſoils; nor do I know any uſeful timber-tree, that maintains itſelf ſo ſtoutly againſt the wind; ſo that, being of quick growth, and clad in its numerous leaves all winter, it is certainly one of the fitteſt plants to nurſe and protect other valuable or delicate trees.

The wood is white, tough, and flexible, is uſeful for many articles to the turner, for mill-cogs, (in which it excels the Yew itſelf), ſtocks, and handles for tools, with many inſtruments of huſbandry; it is a laſting fire-wood, and burns very clear.

It likewiſe, of all the trees yet known, beſt preſerves itſelf from the deer browſing on it, ſo that clumps of them in deer-parks would be no ſmall improvement, both in point of beauty, and for ſhelter to theſe animals, ſo deſtructive to other trees.

CHAPTER IX.

The WALNUT TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers at ſeparate diſtances on the ſame tree. The male flowers are diſpoſed in an oblong rope, or catkin, which is cylindrical and imbricated, with ſpaces between the ſcales; each ſcale has one flower, with one petal fixed in the outward centre, toward the outſide of the ſcale. The petal is divided into ſix equal parts; in the centre is ſiutated many ſhort ſtamina, terminated by erect acute ſummits. The female flowers grow in ſmall cluſters, ſitting cloſe to the branches; theſe have a ſhort, erect four-pointed empalement, ſitting on the germin, and an acute erect petal, divided into four parts. Under the empalement ſits a large oval germin, ſupporting two ſhort ſtyles, crowned by large reflexed ſtigmas. The germin afterward becomes a large oval dry berry, with one cell, incloſing a large oval nut with netted furrows, whoſe kernal has four lobs which are variouſly furrowed.

The SPECIES *are:*

1. The common WALNUT.
2. The large French WALNUT.
3. The thin-ſhelled WALNUT.
4. The double WALNUT.
5. The late-ripe WALNUT.
6. The hard ſhelled WALNUT.

7. The Virginian black Walnut.
8. The Virginian black Walnut, with a long furrowed fruit.
9. The Hickory, or white Virginian Walnut.
10. The ſmall Hickory, or white Virginian Walnut.

Mr. MILLER, in his Dictionary, ſeems to be of an opinion, that the firſt-mentioned ſix are only ſeminal variations, and not diſtinct ſpecies, as in moſt other ſorts of fruit-trees; and ſays, the trees raiſed from their different ſeeds, rarely produce the ſame kinds of fruit. This is a point I have not yet lived to determine; for though I have planted the ſeed of all the different ſpecies of the Walnut, I have as yet reaped but little fruit; however one circumſtance I am well aſſured of, that the fruit of the ſecond and third ſorts, of which I have eaten many, are very different, and bear much finer fruit than the others: Therefore, to make ſure of the beſt, at leaſt for a gentleman's private uſe, I would adviſe, that theſe two ſorts be inarched on the common Walnut, on which they will ſucceed, and produce fruit in one third of the time they would do from ſeed, though the tree will not be either ſo large or ſo laſting.

Of all trees, the Walnut is one of the moſt difficult to reduce to any regular uniform appearance; it naturally grows in a ragged diſorderly manner, and pruning being deſtructive to it, it deſpiſes the art and induſtry of the gardener: With reſpect then to its form and growth, we will leave them to nature, and only endeavour to point out ſome aids, that will much aſſiſt in the early, and plentiful production of good fruit, and which unaſſiſted nature will be many years in effecting.

Inarching the particular kinds you chuſe, has already been mentioned; but in order to make extenſive plantations for fruit, proceed as follows:

Having procured from France, a parcel of the largeſt and beſt-ripened nuts, of the ſecond and third ſorts, provide alſo a parcel of thin flat ſtones, tyles, or ſlates, from a foot to eighteen inches broad; lay them cloſe together in lines, the length of the quarter in the nurſery, intended to be planted; bury them in the ground about eight inches deep, and plant your Walnuts ſix inches aſunder, and two inches deep, in a line over the middle part of the tyles; the tender roots thus meeting with oppoſition, and unable to penetrate further, will ſpread themſelves on the ſurface of the tyles, *&c.* but not having ſo much nouriſhment or moiſture in dry weather, as when free in the ground, they will require frequent but gentle waterings, both the firſt and ſecond ſummer, as they are to ſtand two ſeaſons before removal.

Having finiſhed the ſecond ſeaſon; early in the following autumn, or as ſoon as their leaves are decayed, and their ſhoots hardened, raiſe them carefully, and, without the ſmalleſt inciſion on root or branch, plant them again fourteen or ſixteen inches aſunder, on the ſame kind of bottom, or hard rubbiſh that will not invite the roots downward. Theſe materials are now to be ſunk three or four inches deeper, and made ſix or eight broader than before, as the fibres of the roots have extended themſelves. At the end of two years, remove the earth from the roots of ſome of the plants; and if you find they have not near covered their bed, they may continue a third; but if they have ſpread over the bed, and are pointing their roots downward, they muſt be removed: During the time of their continuance here, they will require moderate watering in dry weather.

Repeat this culture once more, making their bedding about three feet broad, when the depth of ſoil above them, muſt be not leſs than fifteen or ſixteen inches; plant them at two feet aſunder, and, as before, without pruning roots or bodies, further than the ſmall branches that grow near the ſurface; and if theſe are rubbed off with your hand early in ſummer, while the ſhoots are tender, it will be preferable to the moſt ſkilful pruning: In this place, if the ſoil is rich, let them remain three years, or, if poor, four.

By this time the trees will be in a proper ſtate for removing to where they are deſigned to ſtand, which, as they are chiefly intended for fruit, ought to be in dry ſound land, with a ſandy, gravelly, or chalky bottom, but by no means in a deep heavy mould, where the roots by their downward inclination, would imbibe the crudities of an ungrateful ſoil, and get below the influence of the ſun and rains, which would not only affect the flavour of their fruit, but would keep the trees much longer from producing it.

Should you plant them in your orchard, let the diſtance be from thirty to thirty-five feet; but why may we not plant them in our fields of wheat and other grain, at ſixty or ſeventy feet diſtance, as they do in Burgundy, where they conſider them as a great preſerver of their crops, by keeping the ground warm in winter, neither do their roots obſtruct the plough? and if the Burgundians find their ſhelter uſeful with them, how infinitely more ſo muſt it be in this cold iſland of ours? But the advantages accruing from the general culture of this tree is not peculiar to France; for in a great part of Germany, they find it ſo profitable, that a law I believe ſtill ſubſiſts there, by which no young farmer is permitted to marry, until he brings proof that he has planted, and is the father of a certain number of Walnut trees. The fruit will ripen perfectly well in all the cultivated parts of Great Britain; and the method of managing the trees, as here directed, being attended to, will render its fruit highly flavoured, ripen it earlier in the ſeaſon, and bear a plentiful crop twenty years ſooner than it would do, cultivated after the old manner. The beſt manure for fruit-bearing Walnut-trees, is, ſtrewing the ſurface of the ground with aſhes, the beginning of winter, the land having been firſt ploughed, or otherwiſe laboured, before that time.

How much would ſuch plantations improve the beauty and wealth of this country? and how greatly is it to be lamented, that men of fortune ſo ſeldom undertake ſuch noble public works, as an aſſiſtance to the poor, the general good of the country, as well as their own private intereſt? for large ſums of money, which are annually ſent abroad, would be ſaved in a few years, and that too at an inconſiderable expence.

Thus having directed the beſt culture, for ſuddenly procuring plentiful crops of Walnuts, it remains to direct the moſt proper manner for cultivating the tree for timber.

The Virginian kinds for this purpoſe, but particularly the ſeventh and eighth ſorts, are preferable to the others; they grow faſter, and become larger and loftier trees, and the wood is alſo ſaid to be of a ſuperior quality.

The Walnut tree is more impatient of tranſplanting than moſt others; the top-roots, being of a pithy hollow texture, ſo do not agree with cutting; which, ſhould it not deſtroy them altogether, weakens them ſo much, that they make little or no advance for ſeveral years, and indeed never become vigorous or comely trees.

Therefore, in order to have a plantation of them for timber, provide a parcel of their nuts, of the ſeventh and eighth ſorts from Virginia, which may be eaſily had at a trifling expence; and having prepared your ground the autumn before, by a good deep ploughing, digging, or beſt of all, by a good trenching, in February plant your nuts in drills drawn out with the hoe, and cover them between two and three inches deep; let the drills be five feet aſunder, and the nuts planted about eighteen inches diſtant in the drill; and as many of them are to remain, to fill the land properly with timber-trees, let the ground be kept clean by hoeing in ſummer, and mellowed by digging before winter, for two years; after which, you muſt carefully raiſe every ſecond plant in the lines, without in the leaſt diſturbing what remains, which will leave them at a ſuitable diſtance for ſtanding four or five years longer. After the firſt two years, the ground between the trees may be employed in crops of

Turnips, Carrots, Beans, Cabbages, and various other kitchen herbs; which, if properly kept in order, will, from the culture the land receives, improve the growth, rather than injure the trees. From time to time, as they advance in height, the leaſt promiſing muſt be taken away, by cutting them below ground, to prevent the roots of what remains from being injured; and this muſt be repeated, but not until their branches are near touching one another, as their ſtanding moderately thick will promote their upright growth; this management is to be proceeded with, until the trees are left at the diſtance of about thirty feet.

If you incline to ſave the plants that are to be raiſed at two years old, take them up with the greateſt care, without wounding the ſmalleſt part of their roots, or bruiſing their fibres, and immediately plant them out at full length, at a ſuitable diſtance, treating them in all reſpects as has been already directed.

Tho' it has been obſerved, that pruning in general is hurtful to this tree, the branches as well as roots being of a ſpungy hollow nature, yet, when it has been neglected to pinch off the young tender ſhoots, ſome degree of it will become neceſſary, where branches croſs each other, as they would deſtroy themſelves, and injure the whole tree; about the middle of September, let ſuch then be cut off ſmooth, and cloſe to the body, that the wound may heal, and be covered before the winter rains; and that as little of this may be practiſed as poſſible, let the plantation be annually examined, and all the young croſs-growing branches taken away, to prevent the neceſſity of lopping old ones, which is doubly hurtful.

The ſoil for the Walnut intended for wood, need neither be ſo warm, or generous, as that for fruit. Indeed, where large growth is only deſired, this tree ſhould be indulged with a deep, ſound, rich-feeding land, on which, if it inclines to marle in the bottom, they will grow amazingly; but, notwithſtanding, they will ſucceed, and make goodly trees, in any ordinary ſoil that has a competent depth of mould, tho' coarſe and ſtoney: I have likewiſe ſeen many ſtately trees of them on clay.

The value of the wood, for chairs, bed-ſteads, tables, wainſcoting of rooms, cabinets, gun-ſtocks, *&c.* is univerſally known.

CHAPTER X.

The CHESNUT TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers on the ſame tree, ſometimes at ſeparate diſtances, and at other times near each other. The male flowers are fixed to a long ſtring, forming a ſort of catkin; theſe have each an empalement of one leaf, cut into five parts; they have no petals, but include about ten or twelve briſtly ſtamina, terminated by oblong ſummits. The female flowers have alſo an empalement of one leaf, divided into four parts, having no petals, but a germin fixed to the empalement, ſupports three ſtyles crowned by a reflexed ſtigma. The germin, which is ſituated at the baſe of the empalement, becomes a roundiſh fruit armed with ſoft ſpines, including one or more nuts.

The SPECIES *are:*

1. The common or Spaniſh CHESNUT.
2. The ſtriped CHESNUT.
3. The Chinquapin, or dwarf Virginian CHESNUT.

THIS much neglected, tho' graceful and magnificent tree, by attending to its proper culture, for fruit, timber, and copſewood, might, in a few years, become among the greateſt advantages this country can reap by planting: I ſhall therefore be particular in directing the beſt methods I know, of propagating them for theſe different purpoſes.

To raiſe them for fruit, procure a parcel of the nuts from Portugal or Spain; pick out the largeſt, and browneſt; the goodneſs of the ſeed is known by its weight, to try which, throw them into water; reject ſuch as ſwim, but thoſe that ſink you may be ſure are good; preſerve them in dry ſand until the beginning of March, when, having prepared a ſpot of looſe mellow ground, ſow them in drills made with the hoe, three inches deep, the drills about fourteen inches aſunder, and the nuts ſix inches in the drill, where, as they ſhoot freely, I would adviſe that they remain only one year.

In February, or early in the following March, (which, from repeated experiments, I prefer to autumnal planting of theſe trees,) remove them to another quarter; ſhorten their top-roots, and with a ſharp knife ſmooth them clean, ſparing their ſpreading fibres, and keep them as little time as poſſible out of the ground, the better to preſerve the fibres from moulding; plant them in lines, two and a half feet aſunder, and one foot diſtance in the line, keeping them clean in ſummer, and ſpading over the ground between the lines ſpring and autumn, when any croſs ill-placed branches may be pruned off; and in this ſituation let them remain two years.

They are again to be removed to another quarter, taking them up with ſuch care, as not in the leaſt to injure their fibres, obſerving to ſhorten their top-roots, to cut off ſuch as croſs each other, and ſmooth the ends of thoſe that ſpread moſt, which will by this time be ſtrong and more numerous; at the ſame time, prune away any ill-placed branches from their bodies and tops; then to be planted in lines four feet aſunder and two feet diſtance in the line, where, managing them in other reſpects as directed for the former nurſery, let them continue three years.

By this time theſe trees will be of a proper age and ſize, either for ornamental plantations in avenues, clumps in parks, the wilderneſs, or in the orchard way for fruit; but it may be not unneceſſary here to obſerve, that the ſhade of the Cheſnut, like that of the Aſh, is obnoxious to other plants, and that they ſhould therefore be placed in thickets, or in detached plantations, by themſelves.

The ground intended for a conſiderable plantation of fruit-bearing Cheſnut-trees, ſhould have three or four ploughings the preceding ſummer and winter; and if one good digging is added a little before planting, it will be a great improvement to the ſoil, as I hold the labour of the ſpade, to be of all others the beſt. This being done, your trees carefully raiſed, and their roots and bodies properly pruned, plant them in ſtraight rows, ſix feet diſtant every way; let the ground be annually dug, to encourage the ſpreading of their roots, and, at this diſtance, they may remain till the branches begin to approach each other, when you muſt take up, every ſecond row entirely, and every ſecond plant in the remaining rows, which will leave them at twelve feet diſtance; the wood of the trees taken up, will be uſeful for many purpoſes of gardening and farming. Having dug or half-trenched the land, (for deep trenching would increaſe their growth, but retard their fruiting), it may, for ſome years, if of a good quality, be profitably employed in Potatoes, Cabbages, Turnips, and many other crops, which, by digging in the leaves of the Cheſnuts, when rotten, (the beſt of all manure for them), will, inſtead of exhauſting, annually invigorate the ſoil, and improve the plantation both for fruit and timber. Theſe trees having ſtood until their branches begin to meet as formerly, muſt again be reduced in the ſame proportion the others were, which will leave them at twenty-four feet diſtance every way, and at which diſtance they may remain for good. The wood of this felling will ſaw into ſmall boards, being now about twenty years old, and whoſe roots muſt be taken out entirely, to prevent their impoveriſing the land. The timber of theſe cut down, being of ſize for ſeveral uſeful purpoſes, will bring a conſiderable price from the joiner, cabinet-maker, *&c.* and the remaining trees, which already have produced fruit for ſeveral years, will henceforward bear vaſt quantities, and make great returns of profit to the owner.

Thus having directed ſuch a culture for the Cheſnut, as if judiciouſly executed, will aſſuredly produce abundant crops of large well-flavoured fruit, much ſooner than when the tree is abandoned to nature. I ſhall proceed to thoſe intended for timber and copſe-wood, the propagation of which will be attended, with little trouble or expence.

Let the field intended for this plantation, (which may be neither warm or rich) be fallowed the preceding ſummer, to get two or three good deep ploughings in winter, to ſweeten and pulveriſe the ſoil, and to deſtroy all weeds. Having procured and tried your ſeed, make drills acroſs the ground with an hoe, at four feet diſtance, in which ſet your nuts, with the point or eye upwards, or fourteen or ſixteen inches aſunder, filling up the drills, and raking the ſurface ſmooth; and for this, and the following year, you may have a line of Beans between the drills, which muſt be topped, and by being kept clean, will be a protection to the young plants, and encourage their growth. At the end of two years, early in the ſpring as has been directed, remove every ſecond plant in the rows, which will leave them about two feet and a half aſunder, and at this diſtance let them remain three years. With the plants taken up as above directed, (being now two years old,) you may make any further plantation required; having ſome in reſerve to make good any defect in the plantations.

At the end of three years, take up (ſo as not to hurt the plants that are to continue) every ſecond row of trees, and every ſecond tree in the remaining rows, which will leave them at the diſtance of eight feet by five. The plants now raiſed will have carroty roots, and few fibres; ſo are not worth planting again, but will be uſeful for ſtakes and poles. Leſt any of the trees that are to ſtand ſhould be looſened, or their fibres expoſed by the taking up of theſe, let the pits be immediately filled up, and the ground dug over, in which ſtate they are to remain another year; in February, let them be cut down, (reſerving only the ſtraighteſt and moſt vigorous,) at the diſtance of twenty-five to thirty feet: You may ſtill continue to work the ground, and take dwarf-crops from between the rows for two years more; after this, they will ſoon cover the ground, when they muſt be left to nature.

Thus you have a copſe plantation, which in ſeven years more, that is, fifteen years in the whole from the ſeed, that will abundantly repay the expence of labour and rent, and, will conſiderably increaſe every ſeven or eight years, for forty or fifty to come, when you will have a foreſt of noble timber-trees, that of themſelves will be worth more than the value of the land at the higheſt purchaſe, beſides theſe trees will produce fruit, but not in ſuch abundance, or of ſo good a quality, as thoſe that have been tranſplanted at due diſtances, and where the ground has been properly cultivated; tranſplanting promotes fructification, as, by it the roots are made to ſpread nearer the ſurface, whereby the juices are better prepared and digeſted by the ſun and air, and, of courſe, their fruit better matured, and of a higher flavour, than thoſe whoſe roots run deep into the cold, ſluggiſh, and unprepared earth, from hence they muſt neceſſarily imbibe a quantity of crude and unwholeſome juices, which will naturally be communicated to the fruit.

The ſtriped Cheſnut is amongſt the moſt beautiful of all the variegated tribe, and, when mixed with other ſtriped plants, has a moſt agreeable and chearful effect, the blotches being of a rich ſhining gold colour, ſtrongly marked. This is uſually propagated by budding, or inarching on the plain ſort, though I have raiſed many of them by common grafting.

The Chinquapin, or dwarf kind, abounds in the woods of America, where it produces abundance of nuts, which by mixing them with dry ſand, may be eaſily brought here, and in which all the nut kinds ſhould be brought from a diſtance, and by not adverting to this ſimple and eaſy preſervative, we generally loſe the greateſt part of them. This tree grows in its native ſoil to about fourteen or ſixteen feet high, and is ſufficiently hardy to bear our ſevereſt winters. This may be propagated by its ſeed as the common Cheſnut, or by inarching on it, which will increaſe its magnitude.

The fruit of the Cheſnut tree is not only uſed for many elegant diſhes in France and Italy, but is found a ſtrong and healthful food for the labouring people, either made into bread, or in a variety of other forms: For which purpoſe, in a few years we might have abundance of them, as well as for feeding hogs, whoſe fleſh they much improve both in taſte and quality, and would render our bacon as good as the Virginian, or of any other country.

The leaves of this tree make excellent litter for cattle, which, when mixed with their dung, (particularly that of cow's well rotted), is an admirable manure for many kinds of flowers, green-houſe, or hot-houſe plants, and others of the moſt delicate tribe.

The beſt ground for the fruit-bearing Cheſnut tree, is a looſe moiſt (though not wet) gravel or ſand: They will likewiſe ſucceed in any ordinary mixed ſoil, which, ſhould it abound with ſmall round ſtones, they muſt not be taken away, as their warmth will cheriſh and forward the ripening of the fruit.

For plantations of timber-trees, or copſe-wood, you can hardly fail, provided there is a depth of ſoil, free of any ſtanding water; they will grow on obſtinate clay, and on the bleakeſt declivities of hills, this tree, when fruit is not the object, grows more luxuriant in a cold, than a warmer climate.

The wood is uſeful for many eſſential purpoſes: It makes good tables, and chairs, and is the moſt laſting poles, when ſet in the ground with the rind on, for eſpaliers, paliſade hedges, and dead fences: It will laſt longer than Elm, or even Oak, for pipes to convey water under ground. In Italy, the beſt caſks for wine and other liquors are made of this wood, which has the ſingular property, when thoroughly ſeaſoned, of maintaining its bulk, without ſhrinking or ſwelling, which moſt other timber does; in antient times it was much uſed in our building, of which was a part of London, and near to it were formerly large foreſts of this tree.

CHAPTER XI.

The HORSE-CHESNUT TREE.

A Deſcription of its Flower and Seed.

The empalement of the flower conſiſts of one leaf, ſlightly cut into five ſegments. The flower is compoſed of five roundiſh petals, folded at their border, and waved; theſe are narrow at their baſe, and are inſerted in the empalement. In the centre is placed a roundiſh germin, having a ſingle ſtyle, crowned with a pointed ſtigma, attended by ſeven ſtamina, which extended to the length of the petal, and are declining, crowned with upright ſummits. When the flower is paſt, the empalement becomes a thick, roundiſh, echinated capſule, opening into three cells, in one or two of which are lodged globular ſeeds.

The SPECIES *are:*

1. The common HORSE-CHESNUT.
2. The yellow blotched HORSE-CHESNUT.
3. The white blotched HORSE-CHESNUT.
4. The ſcarlet flowering HORSE-CHESNUT.

THE firſt mentioned ſort, though a native of Conſtantinople, defies the greateſt ſeverity of our winters, and ſoon becomes a large tree. The nuts of it may be ſown as directed for the Sweet Cheſnut, and, like it, ſhould only remain one year in the ſeed-bed.

In the following February, or early in March, having reduced their top-roots, plant them in lines, three feet aſunder, and at fifteen inches diſtance in the line, here to remain three years.

To encreaſe them to a proper ſize for avenues, or clumps in parks, and lawns, remove them to another quarter; dreſs the roots properly, and prune ſome of the under branches, with any others that croſs each other, and are too thick, or are ill-placed; but beware of the large bud at the extremity of the leading branch, in which is incloſed the ſhoot in embryo for the ſucceeding ſeaſon: Plant them in lines, ſix feet aſunder, and two and a half feet in the line. In this ſituation, when in an ordinary ſoil, they may continue three, but not above four years, when the plants will be from twelve to fourteen or fifteen feet high.

The ſecond and third ſorts may be propagated, by budding them on the common kind, on which they will take freely.

The ſcarlet-flowering Horſe Cheſnut, is a beautiful plant, and produces a very rich and elegant flower. It is a native of America, but is ſufficiently hardy, when four or five years old, to bear our climate, in very ordinary ſituations, tho' in its infancy is ſomewhat more delicate than the common: Therefore, having procured their nuts, (which you may eaſily do from South Carolina, where they grow abundantly) ſow them as directed for the common kind, but in a warm ſheltered ſituation, and in a rich looſe ſweet mould; the ſucceeding ſpring remove them to a ſituation and ſoil equally favourable and good, where they are to remain three years, when they will have acquired ſufficient ſtrength to put up with more common uſage. This tree in America, grows to the height of thirty feet, but I have not ſeen any in Britain of near that ſize, and I doubt it will never arrive to that ſtature with us; notwithſtanding which, it is well worth our cultivation, and has a fine effect in the wilderneſs, planted with trees of the ſame growth.

This may alſo be budded or inarched on the common kind; but they will neither make ſo handſome plants, nor ever grow to near the ſize of thoſe raiſed from ſeed.

The Horſe-Cheſnut, is a tree of ſingular beauty when in bloom; and the common ſort, which will ſucceed in almoſt all ſoils, (tho' beſt in that which is deep and well ſheltered) is a very proper tree to be intermixed in ornamental plantations; but in bleak and expoſed ſituations, it is idle to attempt it, for their wood being remarkably brittle, they are ſubject to be injured by every impetuous blaſt.

The fruit of this tree, is ſo extremely bitter, that even hogs will not eat it, but the Turks mix it with other food, for their horſes that have coughs, or are broken-winded, for which it is ſaid to be very efficacious.

The timber, except for fuel, anſwers no valuable purpoſe; however, I have been informed by a gentleman of much knowledge and obſervation on the qualities of wood, that it is very proper for pipes, to convey water under ground, and in that ſtate, will laſt longer than many harder woods.

CHAPTER XII.

THE *LARIX*, OR LARCH TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers growing ſeparate on the ſame tree. The male flowers are diſpoſed in a ſcaly catkin; theſe have no petals, but a great number of ſtamina, which are connected in a column below, but are ſeparated at their points, and are terminated by erect ſummits. The female flowers are diſpoſed in a conical ſhape, having no petals; theſe are placed by pairs under each ſcale, having a ſmall germin, ſupporting an awl-ſhaped ſtyle, crowned by a ſingle ſtigma. The germin afterward becomes a nut with a membraneous wing, incloſed in the ſcales of the cones.

THE Larch tree may be propagated from ſeed; but the beſt manner of procuring it, is not generally known, at leaſt I am certain it is very rarely attended to. The common method is, to gather the cones in autumn; and having half-roaſted them in a kiln, a ſtove, or on a hearth before the fire, then to ſplit the cones, and to pick out the ſeed with a knife or other ſharp inſtrument, which are with difficulty got at, by which means many of the plumpeſt and beſt ripened ſeed are bruiſed. In this practice I proceeded for ſeveral years, without the ſucceſs ſuitable to my labour and expence. I ſowed the ſeed, with attention, in different ſoils and ſituations, and repeated a variety of experiments, yet had thin crops in proportion to the ſeed ſown; I at laſt diſcovered my error;

and from experience, ſhall direct a method, by which, the ſeed may be procured as good, the plants raiſed in the ſame abundance, and with the ſame eaſe, as the common kinds of Fir and Pines.

I found, that tho' the cones of the Larch tree are at their full ſize in autumn, yet the greateſt part of the ſeed they contain have not arrived to maturity, and that they ripen hanging on the trees, even during the coldeſt winter months. The ſeed are incloſed in ſo hard and thick a covering, that the ſevereſt ſeaſons cannot affect them; therefore I deferred gathering the cones until the months of March or April, when they eaſily part from the tree, and many even dropped from it, which are found better than thoſe plucked off. The cones thus procured, being fully ripe, ſhould be ſpread in a dry covered place, until the weather comes in warm; in May or June, let them be expoſed under glaſſes, placed in a ſouth aſpect, ſo as to receive the warmeſt influence of the ſun: This muſt be repeated (removing them every evening before the dews fall) for ſeveral weeks, when the cones will open, and part with many of their beſt ſeeds by ſhaking them in a wire ſieve; but as all the cones will not open, ſplit them through the centre, from the bottom to the top with a piece of ſharp iron: Let theſe be again expoſed to the ſun for a few days, when many more of the ſeeds will ſhake out, or may be readily ſeparated from the huſk, with the point of a knife.

Tho' the ſeed will keep good for four or five years, yet, when diveſted of the cone, they loſe their growing quality in a few months; therefore, as ſoon as they are taken out, let them be mixed with fine dry ſand, and preſerved in bags until the ſowing ſeaſon.

In the beginning of March, or as ſoon as the weather will permit, having prepared a ſhady border of looſe, mellow, rich ground, expoſed to the morning ſun, ſow your ſeed very thin in beds three and a half feet broad, with alleys of eighteen inches; preſs the ſeed gently into the bed with the back of a ſpade, ſo as, by making it ſmooth and level, it may receive an equal covering of fine compoſt earth, mixed with one-fourth of ſea-ſand, or in failure of it, the fineſt pit-ſand, to be ſifted over them to the depth of a quarter of an inch and no more. In a fortnight after ſowing, if the weather proves dry, and not froſty, give them gentle waterings in the evening of every fourth or fifth day, and in ſix weeks they will begin to appear above ground. As theſe plants come up with the ſeed on their tops, which the birds are very fond of, care muſt be taken to protect them from thoſe enemies, who otherwiſe will deſtroy them, which may be prevented, by driving a few forked ſtakes round the beds, and ſpreading over them a net, or any other thin covering. The plants being fairly above ground, they muſt for three weeks, be refreſhed with a little water every ſecond or third night, when it does not rain: But this muſt be given with care, and as lightly as poſſible, with a watering-pot that has a ſmall roſe to it; for theſe plants, notwithſtanding they are claſſed amongſt the hardieſt trees, when advanced, are, in their infant ſtate, very delicate; and very liable to be greatly injured, if not deſtroyed by heedleſsly daſhing on the water. This careful watering, muſt be continued until the end of Auguſt, and tho' but once in ten or twelve days, increaſing the quantity as the heat increaſes.

The weeds muſt be carefully taken out on their firſt appearance, otherwiſe, it will be impoſſible to draw them up, without bringing with them many of the plants.

It may probably be remarked, that I have directed much unneceſſary trouble and expence in the culture of this hardy tree, which is now raiſed in great abundance, with much leſs ceremony: To which I ſhall anſwer, that, in point of expence, what I have now directed, is much the cheapeſt, as one pound of ſeed will produce, more than ten pounds in the common way; and, what is yet of much higher importance, one thouſand plants, thus cultivated, are of more real value, than ten thouſand in the other.

The end of March, or the beginning of April, the plants may be removed from the ſeed bed to the nurſery; and their roots being ſhortened, let them be laid in rows, about fifteen inches diſtant, and ſix or ſeven inches aſunder in the row, watering them at planting, which may be continued once a week, in dry weather, for five or ſix weeks, when they will be paſt danger; and here they ought to continue no more than one ſeaſon.

About the ſame time, in the ſucceeding year, remove them to another nurſery, but be now ſparing of their roots, taking away only ſuch as croſs each other, with ſome of the ſtraggling hairy fibres, and ſmoothing the extremity of the long ones; plant them in rows, at three feet diſtance, and fifteen or ſixteen inches in the row; watering them when planted, keep them clear of weeds during the ſummer, dig the ground between the rows in autumn and ſpring, and, in this ſituation, let them remain two years.

By this time, in an ordinary ſoil, the trees will be from five to ſix feet high, and of a proper ſize to tranſplant in large numbers, and, in expoſed ſituations, on meagre hungry ground; but where beauty and ſhelter are immediately required in plantations near the houſe, proviſion ought to be made of larger plants: Therefore, for this, or the like purpoſe, let ſuch a number of theſe trees as may be wanted, be removed to another nurſery, and planted at the diſtance of eight feet by ſix; ſtill be ſparing of their roots, which do not, like many other Foreſt-trees, admit of being much reduced or wounded, particularly, when large at planting; let them be plentifully watered, digging the ground about them, as formerly directed; and here they muſt remain three years.

Theſe trees will now be from ten to twelve feet high, and of a very proper ſize to remove for ornament, ſhade and ſhelter, where they are intended to remain, and which may be accompliſhed without any great labour or expence. The plants, thus far advanced, ſhould be removed earlier in the ſpring, than has been directed for the younger trees, which, in ſomewhat more temperate ſeaſons, may be beſt performed, about the end of February, or early in March. At this time raiſe them carefully, without injuring any of their principal roots, and only ſmooth the extremities of their ſmall ones with a ſharp knife, taking up as much as poſſible of the earth adhering to them; pour into the pit a large watering-pot full of water before the tree is placed in it, another after the roots are half covered, and a third after all the earth is properly gathered about it. If the ſeaſon is moiſt, theſe plants will require no farther trouble; but in caſe of a long-continued drought, they ought to be watered in thin dry ſoil once a fortnight; but where it is deep and ſound, every third week, and this to be repeated twice or thrice, or even four times, according to the ſtate of the weather; but, in giving them water, do not pour it cloſe on their trunks, but make a drill round them with the hoe, about a foot diſtant, into which gently pour the water, drawing the earth over the place again, as ſoon as the water is abſorbed.

Moſt of the Larch trees, except thoſe that are ſheltered by an higher plantation, decline much by being expoſed to the ſouth-weſt winds; which is occaſioned by unſkilfully pruning them. This tree, planted in a ſoil with which it agrees, (nor indeed is it nice in its choice) will make prodigious ſhoots, which are both heavy and flexible when young, and ſhould any number of the ſide-branches be cut away, the length of the leading ſhoot is too much increaſed, when the body becomes ſlender, and the tree naturally bends with its own weight, and grows obliquely; this evil in the Larch tree, is not to be redreſſed as in other trees, by reducing their heights, it being their certain deſtruction: I therefore adviſe, that not a ſingle branch be taken from this tree, except ſuch as by accident may have been broken or bruiſed, till they are fifteen or ſixteen feet high; nor would I ſuffer any pruning, were it not to clear the ſurface of the ground, ſo as to admit the rays of the ſun, to diſſipate its noxious vapours: But as this may ſometimes be neceſſary, when they have arrived at the height mentioned, the loweſt tire of branches may then be cut off cloſe and ſmooth, about the middle of October; the following year a ſecond time, and the ſucceeding a third. This will be clearing the trunk to about four or five feet high, higher than which they ſhould never be pruned, to make them well proportioned and ſtraight trees, capable of reſiſting the winds, which they will effectually do with this culture; beſides, as they naturally grow in a regular pyramidical form, their greateſt beauty is loſt, when diveſted of their branches.

This is a noble and valuable plant; the bright red bloſſoms it produces in the ſpring, are both beautiful and fragrant, and the proper culture of it, claims our particular attention, for many reaſons. It is a native of the Alpine and Pyrenean mountains, and loves an elevated ſituation: It will become a ſtately tree in the pooreſt hungry ſand and gravel, and on the higheſt and bleakeſt hills, where there is but a few inches of ſoil; in ſhort, it rejects no quality of earth that is dry, but in wet lands it will not ſucceed.

The many encomiums beſtowed both by antient and modern authors on the virtues of this tree, and the great value of its timber, would exceed the bounds allotted for this work: I ſhall therefore only enumerate a few of the beſt atteſted circumſtances, but which may be ſufficient to recommend it to all judicious planters and others, lovers of their country and improvement.

From the wounded bark of this tree, exudates the pureſt Venice turpentine; and on the body and branches, grows the Agaric, a drug uſed in medicine. The famous architect Scamozie, built with it many of the moſt ſuperb palaces in Venice, and highly commends it; and Vitruvius laments that they had not enough of it in Rome for joiſts, and other parts that require both ſtrength and durability, as well as for its property, of long reſiſting fire. The Forum of Auguſtus was built of this timber, as were ſundry magnificent bridges by Tiberius. Poſts of it driven into the ground become almoſt as hard as iron, and will bear an incredible weight. It bears the ſmootheſt poliſh, and is ſo exceedingly tranſparent, that rooms wainſcotted with it, will appear at a diſtance, (when candles are lighted,) as if in a glow of fire. Nor was it uſed for theſe purpoſes only, but in building of ſhips alſo; de Witſen, a Dutch writer on naval architecture, mentions a ſhip, thirty feet in length, to have been found not long ſince in the Numidian ſea, twelve fathoms under water, chiefly built of this timber and Cypreſs, both ſo hardned as to reſiſt the ſharpeſt tools; nor had time in any part treſpaſſed on it, though it had lain four teen hundred years ſubmerged. It makes the beſt palats for painters to ſeparate their colours on; and it was on boards of the Larch, that Raphael, and the moſt famous artiſts of that time, eternized their ſkill, before the uſe of canvas was introduced.

Is it not amazing, then, that thouſands who have it in their power, will not be at a moderate expence to plant a number of this plant, on their barren heaths, and cold rugged hills, which, in a few years, would not only adorn, and, by the warmth they would afford, really improve the adjacent country, and, in leſs than an age, inrich their families?

CHAPTER XIII.

THE VIRGINIAN TULIP TREE.

A Deſcription of its Flower and Seed.

The proper involucrum of the flower is compoſed of two angular leaves, which fall off; the empalement is compoſed of three oblong plain leaves like petals, which fall away. The flower is nearly of the bell ſhape, and has ſix petals, which are obtuſe and channelled at their baſe; the three outer fall off; it has a great number of narrow ſtamina, which are inſerted to the receptacle of the flower, having long narrow ſummits faſtened to their ſides, and many germin diſpoſed in a cone, having no ſtyle, crowned by a ſingle globular ſtigma. The germin afterward becomes ſcaly ſeeds, lieing over each other like the ſcales of fiſh, in reſemblance of a cone.

THIS tree is common in Virginia, and is to be found in the northern continent of America, from whence they are annually brought in abundance to Britain.

Some direct the ſeed to be ſown in pots, and placed on an hot-bed; and when the plants are a year old, each to be planted in ſeparate pots, and again plunged into another hot-bed; after which, they are to be kept in winter, in pots, and under frames, for three or four years longer, until they have acquired ſtrength. This method I followed in my early practice, and no doubt it will both raiſe and preſerve them for that time: But there is not any occaſion to treat this tree with ſo much delicacy,

licacy, even in infancy: I ſhall therefore direct an eaſier and cheaper way of cultivating it, founded on experience, which, in an ordinary ſoil, and ſheltered ſituation, will make much ſtronger and hardier plants, and by that means ſooner prepare them for removal to the places, where they are meant to remain for good.

The beginning of March, prepare a bed of good mellow rich earth, well mixed with old rotten cow-dung, expoſed to the ſun, and ſheltered from cold winds; place over the bed an old frame and ſow your ſeed, ſifting over them, about half an inch of a ſoil prepared ſome months before, to conſiſt of one load of old paſture-earth, one of well-rotted cow-dung, and half a load of ſea or fine pit-ſand. Some of the ſeed will probably make their appearance in nine or ten weeks, but much the greater part of them will lie in the ground until next ſpring; I would therefore adviſe giving the beds no more water, than barely ſufficient to cheriſh the plants that have appeared, which, for four or five weeks, ſhould be ſcreened from the ſun during the heat of the day, but which afterwards ſhould receive its full influence.

Theſe circumſtances being attended to, no further care is neceſſary for this year, than to clear the ground of weeds as ſoon as they appear; and in winter, in violent laſting ſtorms, to throw double mats over the frame, which muſt be regularly taken off, on the weather's growing mild.

In March of the ſucceeding year, carefully pick off from the bed with your fingers, all moſſy, hard, and cruſted earth; ſmooth it again, and ſift on a quantity proportioned to that taken away, of the ſame kind of compoſt as already directed; and about the end of April, or beginning of May, if your ſeed have been good, the plants will appear in abundance, when they muſt be frequently, but gently refreſhed with water, lightly given as directed for the Larch. From this time, until the beginning of Auguſt, they ought to be ſcreened from the mid day ſun; but this I would not do by covering the bed with mats, as it draws the plants, and renders them tender; but rather do it with an old reed fence, or, nail ſome thin boards together, the length of the frame, ſo high as to ſhade the ſurface of the bed from the meridian ſun, yet admitting a free current to the air. By thus ſhading the plants, and at the ſame time ſuffering them to enjoy the open air, they will not ſpindle, but keep proportioned, and be more hardy. When this has been performed, no further care is neceſſary in this ſituation, but frequent and moderate waterings in an evening, and throwing a mat over the frame during any ſevere winter-ſtorm.

About the beginning of the following April, (for this tree is late in expanding its leaves), prepare a ſpot of ground, in the ſame manner, and of the ſame quality with that directed for the ſeed; raiſe the plants carefully with a trowel, without bruiſing their roots, which are ſoft and ſpungy; and if they cannot be immediately planted, mix a pale-ful of ſifted mould and water, to the conſiſtence of pap, through which draw the plants one by one, until as much adhere as will cover their roots and fibres. This will prevent their drying, and in this ſtate they may ſafely be ſent to a conſiderable diſtance, and kept ſeveral days out of the ground. The roots of this tree do not admit of being much reduced; therefore, at this time, cut only a little of the top-root ſmoothly off, but let all the fibres remain, and then, in a ſheltered ſituation, plant them in drills cut out with the ſpade, at a foot diſtance line from line, and ſix inches in the line. Five of theſe lines, will make a bed four feet wide; and if you have more beds than one, leave an alley of three feet between them; let them be frequently and more plentifully watered than formerly, in the evenings during the ſummer months; after this, keep them clear of weeds, and in caſe of ſevere froſt, (for the firſt winter,) throw a mat over them, looſening the ground between the beds in ſpring, when they will require no further attention in this plantation, where they ſhould remain only two years.

From theſe beds the plants are to be removed to another nurſery, of a good mellow deep ſoil; but be ſtill ſparing of their roots, and plant them in rows, at three feet and a half diſtant, and eighteen inches in the row; keep the ground clean and mellow by labour, as has been directed, giving them plentiful waterings in dry weather, during the firſt ſummer; here they are to continue three years longer.

The culture directed having been attended to, theſe trees will now be ſufficiently hardy to defy the aſſaults of our ſevereſt winters, and, being about ſix or ſeven feet high, will be of a good ſize for planting where they are deſigned to remain. In a generous deep ſoil, interſperſed with other trees, (but not crowded) they will in a few years arrive to a great magnitude; but in thin and hungry land, they make but a ſmall progreſs, notwithſtanding they will flower ſooner.

In America, they often grow on a moiſt ſwampy ground; and in ſuch I have planted them here, but without ſucceſs, owing, I ſuppoſe, to our long wet winters rotting their tender roots.

They do not, like many other Foreſt-trees, admit of being planted to advantage of a great ſize, but they might undergo another remove more than has been here directed, when at the height of ten or twelve feet, which I have done with great ſucceſs. I know of no tree, that pruning either root or branch, has a worſe effect on than this, as it frequently kills it, or renders it ſtunted; therefore the plants ſhould be reduced to the form you deſire, in the nurſery, by rubbing off all ill-placed buds, or, with your finger and thumb, pinching away the improper branches ſoon after their appearance, any other diſcipline they will not be ſubject to.

This plant is of an extraordinary beauty and ſtatelineſs, and highly deſerves a place in all noble and elegant plantations. There is one to be met with in the Earl of Peterborough's garden, at Parſons-green, near London, which has continued in full bloom for ſeveral years: It is above fifty feet high, and the trunk in proportion, and would have been much larger, had it not been planted in a wilderneſs quarter, where it was long neglected, and injured by its branches being overhung, and the roots intangled with other trees, which prevented it receiving its due nouriſhment. Mr. Cateſby, in his Natural Hiſtory of Carolina, mentions it of being thirty feet in circumference in the trunk, and the timber highly valued by the Americans for its ſtrength and durability.

CHAP.

CHAPTER XIV.

The ACACIA TREE.

A Deſcription of its Flower and Seed.

It hath male and hermaphrodite flowers in the ſame catkin, and female flowers in different plants. The male catkins are long, compacts, and cylindrical, and have each a three leaved ſmall empalement; they have three roundiſh petals, which ſpread open in the form of a cup; theſe have a turbinated nectarium, whoſe mouth afterward grows to the parts of fructification; they have ſix ſlender ſtamina, which are longer than the petals, terminated by oblong compreſſed ſummits. The hermaphrodite flowers in the ſame catkin, are ſituated at the end; theſe have empalements, petals, and ſtamina like the male, and have a germin, ſtyle, and ſeeds like the female, which are ſituated on different trees, and are diſpoſed in a looſe catkin; theſe have a five leaved empalement, and have five oblong petals, with two ſhort thread-like nectariums, and a broad germin longer than the petals, ſupporting a ſhort reflexed ſtyle, crowned by a thick ſtigma. The germin afterward becomes a large flat pod, with ſeveral tranſverſe partitions, having a pulp in each diviſion, ſurrounding one hard roundiſh ſeed.

The SPECIES *are:*

1. The common or Virginian ACACIA.
2. The American ACACIA, with triple thorns, commonly called the LOCUST TREE in the Weſt-Indies.
3. The Water ACACIA, from Carolina.

THERE are above thirty different ſpecies of this plant, that have been brought from Africa and America, but moſt of them are tender, and require the protection of the green-houſe or ſtove, and would be improperly claſſed in a Treatiſe on Foreſt-trees, particularly adabted for this climate; therefore I have only mentioned three kinds, which are ſufficiently hardy to bear our ſevereſt winters, and to grow to a very conſiderable ſize.

The firſt ſort is propagated by ſowing its ſeed the beginning of March, on a bed of well-prepared mellow ſoil, ſhaded from the mid-day ſun, which, in five or ſix weeks, will appear above ground, when they muſt be frequently watered in the evenings, during the hot and dry weather, and the weeds deſtroyed at their very firſt appearance.

About the beginning of April of the following ſpring, remove them from the ſeed-bed to the nurſery, but be ſparing of their roots, and plant them in lines, two feet diſtant, and a foot aſunder in the line, watering them at planting, as well as three or four times more, ſhould the weather prove dry, when they will require no further attention than to keep the ground clean, digging between the lines in the ſpring of the two following ſeaſons, as they are to remain here two years.

From this nurſery they may be tranſplanted to where they are to remain for good; but if they are wanted of a larger ſize, they muſt undergo another remove, and be planted in lines, three feet and a half diſtant, and eighteen inches in the line, treating them as formerly: But here they muſt continue no longer than two years; for as theſe plants do not naturally produce ſpreading roots, and will not bear to have them or their branches much cut, but rather that they ſhould grow in a ragged, diſorderly manner, with heavy tops; therefore they do not admit of being planted when large.

The ſecond and third ſorts, though they will alſo riſe in the open ground, yet are ſomewhat ſhyer, but will appear ſooner, and make better ſhoots, when aſſiſted with a very moderate hot-bed, on which they may be ſown the middle of February. When the ſeed appears, give them very gentle but frequent waterings, and let the frames be raiſed in the day-time, that the plants may have plenty of air; ſhelter them from the mid-day ſun until about the beginning of Auguſt, when the frames may be removed until the winter's froſt ſet in, when the glaſſes are to be replaced, but drawn off in mild weather.

The ſucceeding ſpring, in the beginning of April, remove theſe plants, and treat them as has been directed for the Tulip-tree; with this difference only, that if you chooſe to remove them a ſecond time, they ought only to remain two years after the ſecond tranſplanting.

All kinds of the Acacias are much improved in their form, by thruſting ſtraight ſtakes into the ground, to which the leading ſhoot ſhould be looſely tied with baſs.

The firſt-mentioned ſort of theſe trees was formerly much uſed in England, for planting in avenues; but for this purpoſe, I know few plants more improper, as no art can reduce them to an uniform figure; and the branches are ſo hard and brittle, that numbers of them are broken off every violent wind, which occaſions them to have a ragged and diſagreeable appearance: The different kinds of theſe trees, ought to be planted in the wilderneſs, or under the protection of ſome other plantation, where, by growing in concert, they will eſcape that misfortune, and where their negligent wildneſs of growth, and large bunches of ſweet-ſmelling aromatic flowers in ſummer, have a pleaſing effect, and intitle them to a place in all ornamental plantations.

They delight moſt in a deep feeding moiſt ſoil.

CHAPTER XV.

THE WILD CHERRY TREE;

In *England*, commonly called the BLACK CHERRY; In *Scotland*, the GEEN TREE.

A Deſcription of its Flower and Seed.

The flower hath a bell-ſhaped empalement of one leaf, cut into five parts; it hath five large roundiſh petals which ſpread open, and are inſerted in the empalement; and from twenty to thirty ſtamina, which are near as long as the petals, and are alſo inſerted in the empalement, terminated by twin ſummits. It has a roundiſh germin, ſupporting a ſlender ſtyle, crowned by an orbicular ſtigma. The germin afterward turns to a roundiſh fruit, incloſing a nut of the ſame form.

The SPECIES *are:*

1. The common BLACK GEEN.
2. The common RED GEEN.
3. The large HUNGARIAN GEEN.
4. The GEEN TREE, with very ſmall ſtones, and large black fruit.

THough this plant is not uſually claſſed in the catalogues of Foreſt-trees, yet its ſtately ſize, fine form, beautiful and fragrant bloſſoms, the various uſes of the fruit, and value of the timber, certainly intitle it to our attention, and places it in no mean rank, either for ornamental or uſeful plantations.

It is propagated from the ſtones of their fruit, which ſhould not be gathered until perfectly ripe, and beginning to decay, when they muſt be diveſted of their fleſhy pulp; and in four or five days when their humidity has evaporated, mix them in ſand, to keep them dry, until their kernels are firm and dry, which will be in about a month; then, having prepared a ſpot of freſh mellow light ſoil, ſow them in beds of three and a half feet broad, with alleys of eighteen inches between them. Should the following winter prove ſevere, and the froſt ſtrong and laſting, throw ſome Peaſe-haulm, or other light covering over them, to be regularly taken off, on the weather's becoming mild. In open winters no extraordinary protection is neceſſary; but after violent and long continued froſts, I have diſcovered many of the ſtones ſplit aſunder, when the kernels thus deprived of their covering generally decay, particularly if the froſts ſet in early in winter. About the beginning of April, the plants will begin to appear above ground, when, (in dry weather,) frequently watering them in the evenings for about two months, will much increaſe their growth.

The following February, remove theſe plants from their ſeed-bed to the nurſery, in any tolerable ſoil not wet or ſtiff; and having reduced the top-roots, plant them in lines, two feet diſtant, and nine or ten inches aſunder in the line; give them two or three waterings in April and May, in dry weather; dig the ground between the lines in autumn and ſpring, and let them remain two ſeaſons.

Remove them from this to another nurſery in October, ſtill reducing their top-roots, ſmoothing the extremities of thoſe that ſpread, cutting off ſuch as croſs each other, with a few of the loweſt branches, or any others that are ill-placed; plant them in lines, four feet diſtant, and eighteen inches aſunder in the line; dig the ground as already directed, and if intended ſoon to bear fruit, let them ſtand here only two years longer; but, if intended for foreſt-trees, they may remain three.

Theſe trees will now be from eight to ten feet high, and of a proper ſize for planting in woods and in wilderneſs work; but for groves, avenues, and clumps in lawns or parks, (for which purpoſe few trees are more proper,) they may again be removed, two or three times, planting them at diſtances proportioned to their ſize, as has been directed for the Elm, until they are ſo large as to be out of danger from cattle, obſerving not to keep them in any one place, more than three years between each removal.

But with reſpect to thoſe principally intended for bearing fruit, a little more attention is neceſſary; for though, by ſowing the ſeed of the largeſt, beſt ripened, and fineſt flavoured Cherries, and in a favourable ſoil, yet but few of the trees thus raiſed, will produce fruit equal to their original; for all kinds of fruit-trees degenerate extremely, by being raiſed from the ſeed, and tho' this tree does ſo in a leſs degree, than many of the others; yet, to inſure and improve the beſt kinds, graft, or rather bud them, which is preferable for all ſtone-fruits, on freſh healthy ſtocks, of three or four years old, raiſed from the fineſt fruits, which, being eaſily performed, ought not to be neglected, to enſure a very valuable return.

A year after budding, theſe trees may be removed to another nurſery, to ſtand two years longer before planted out for good, ſtill reducing their downright roots, but encouraging thoſe that ſpread near the ſurface as much as poſſible; and now all too luxuriant and ſuperfluous branches are to be taken away, and the plant reduced to the form it is to remain in: From this practice, in two years more, it will be covered with bloſſoms, and loaded with fruit. But in this place, it will be neceſſary to caution againſt a general error, committed in the management of this and many other fruit-bearing trees, which is, pruning them to a conſiderable height with naked bodies. This deſtroys the beauty of the plant, as well as impairs the quantity and quality of the fruit, by exhauſting the ſap that ſhould feed it; for the trunk will be ſooneſt and beſt fed, whoſe branches are the leaſt diſtance from the ground.

Though I have mentioned pruning this tree, yet I muſt adviſe it to be done as ſparingly as poſſible, and only while the branches are young and tender, as lopping the old wood commonly occaſions a gum and canker, that ſtunts and in general deſtroys the whole plant: But a little care and attention from the beginning, may eaſily remedy this, by rubbing off ſuch young buds as are improperly placed; and this practice will preſerve them longeſt in ſtrength and vigour.

For improving both the ſize and flavour of the fruit of the Black Cherry, it ſhould be planted in a freſh, mellow, dry ſandy loam; for timber, it will grow to a large ſize in moſt dry ſoils, even though poor and thin; but in wet ground, or ſtiff clay, it will not ſucceed to advantage. It is one of our hardieſt trees, of quick growth, and, its many good qualities conſidered, I have been often amazed that great numbers of them have not been univerſally planted in all extenſive deſigns.

The wood is hard, ponderous, and durable; it poliſhes very highly, and is uſed by the joiner for cabinets, chairs, and many uſeful purpoſes.

To the Black Cherry, being of the ſame genus, I ſhall add

THE BIRD CHERRY, in *Scotland* called the HAGBERRY.

THO', in catalogues, this is placed in the third or loweſt growing claſs of trees, that is, from fifteen to thirty feet high, yet I have ſeen it above forty, and have raiſed many of them myſelf above thirty feet, at ſixteen years old. It is a plant of extraordinary beauty when in bloom, the bloſſoms being ſo thick as to cover the leaves, when the whole tree is as white as ſnow, and has an admirable effect amongſt other flowering plants.

It grows freely from cuttings, which ought to be planted in a ſhady border in February, and in drills cut down with the ſpade, about eight inches deep, leaving two buds of the cutting above ground; let the lines be two feet diſtant, and the plants nine or ten inches in the line; where, keeping them clear of weeds, and digging the ground between them, here to be kept two years.

After that time, remove them to another ſpot, cutting away the ſuperfluous roots and branches, and plant them in lines, three and a half feet diſtant,

tant, and eighteen inches aſunder in the line; clean and dig the ground as before, and let them remain two or three years longer, when they will be of a proper ſize to plant where they are to remain.

This plant is extremely hardy, and will grow in almoſt any ſoil, but chiefly affects a deep, moiſt, feeding mould, where it will make great advances very ſuddenly. This wood is uſeful for many different purpoſes in huſbandry.

CHAPTER XVI.

THE POPLAR TREE.

A Deſcription of its Flower and Seed.

The male and female flowers grow on ſeparate trees. The male flowers or catkins, have one oblong, looſe, cylindrical empalement, which is imbricated. Under each ſcale, which is oblong, plain, and cut on the border, is ſituated a ſingle flower without any petal, having a nectarium of one leaf, turbinated at the bottom, and tubulous at the top, and eight ſtamina terminated by large four-cornered ſummits. The female flowers are in catkins like the male, but have no ſtamina; they have an oval acute-pointed germin, with ſcarce any ſtyle, crowned by a four-pointed ſtigma. The germin afterward becomes an oval capſule with two cells, including many oval ſeeds having hairy down.

The SPECIES *are:*

1. The white POPLAR.
2. The black POPLAR.
3. The trembling POPLAR, or ASPIN.
4. The ABELE.
5. The white POPLAR, with ſtriped leaves.
6. The Lombardy POPLAR.
7. The Carolina black POPLAR.
8. The Balſam POPLAR from Canada.
9. The berry-bearing POPLAR from Canada.

I SHALL begin with the four firſt kinds of this tree, which are commonly known to us, and then proceed to treat of thoſe that have been lately introduced into this country.

The firſt, ſecond, and third ſorts, are with the greateſt eaſe propagated by cuttings, planted in February or March; and tho' the fourth will likewiſe grow from them, on moiſt ground, yet it more readily ſucceeds by ſuckers taken from the roots of old trees, of which they have great numbers. The cuttings or ſuckers are to be planted in the nurſery, in lines, two and a half feet diſtant, a foot in the line, and eight or ten inches deep, when they will, in two years, make ſtrong plants, which will be fit to be removed where they are deſigned to remain: But to be more expeditious, where ſhelter and ſhade are immediately required, procure truncheons or ſtraight poles, eight or ten feet high; make a hole with a ſharp ſtake, from eighteen inches to two feet deep, as the pole is longer or ſhorter; and in this ſet it, filling the hole full of water, preſſing firmly in ſome fine mould, to keep the plant ſteady. From this cheap and ſimple practice, they will grow freely, and in a few years become large trees; their culture being ſo very eaſy, it is unneceſſary to be more particular.

Of all the trees our climate produces, I know of none, that ſo great and general an advantage might be made, as by planting Poplars in the cold, wet, and uncultivated parts of this country; they will grow luxuriantly in the pooreſt wet bogs, in the moſt devouring clays, in burning ſand or gravel, as well as in the moſt ſteril barren moſs, and the quick advance they make in ſuch ſituations, is amazing. I have meaſured ſhoots of the white Poplar, eight feet long of one year's growth, and have often heard of its being exceeded; but there is hardly any land ſo wet and ſteril, as not to encreaſe them, three or four feet annually, for many ſucceſſive years.

The ſhade of this tree is ſalubrious and friendly, both to animals and vegetables, and their leaves, which are ample and thick, pregnant with rich ſweet juices, fall in ſuch abundance, as ſoon to create a ſoil that will produce good meadow, or paſture graſs, as the ſituation is moiſt or dry. To effect this, I would adviſe theſe trees to be planted on our uſeleſs land, in lines, ten feet diſtant, and five aſunder in the line. In five or ſix years, take away every ſecond tree, which will leave them at twenty feet by ten; and in ſeven or eight years more repeat the ſame, which will make them forty by twenty; at this diſtance they may remain until fit for the axe.

The Poplar naturally produces many branches from their trunks when young, which ought to be cut away cloſe every third or fourth year, to the height of fourteen or ſixteen feet, to admit a free circulation of air to the ground, as well as to promote the growth of the tree; and when the ſoil has thickened, (which in a few years it will,) ſow on it ſome white clover and natural graſs ſeeds, ſaved from an old upland paſture. In doing this, the land is not to be ploughed, but the ſurface frequently looſened, by a light harrow with ſhort wooden teeth, until well pulveriſed; then cover the ſeed, by drawing ſome branches lightly over them, and rolling the ground. This may be done any time from March until Auguſt, as the ſhade of the trees will prevent the ſeed from periſhing by drought; but the ſooner after March, the better, particularly, where the land is very wet, as, by early ſowing, the roots of the graſs will be better eſtabliſhed, and not ſubject to be raiſed in winter, which frequent light rollings early in autumn, when the weather is dry, will likewiſe much contribute to prevent. The ſecond ſpring after ſowing, when the ground will be well covered with graſs, and fit either for paſture or mowing, the trees may be diſbranched to the height of twenty-four feet, when the prunings will be uſeful for fuel, dead fences, and many other purpoſes in huſbandry. It is remarkable, and what I have often noticed, that, immediately under the ſhade and droppings from this tree, the graſs is ſooneſt eaten by cattle.

After theſe grounds have been paſtured for eight or ten years, ſuch of them as are tolerably dry, may be converted into corn-land, by taking away the line of trees at twenty-feet diſtance, which will leave the plantation at eighty feet by forty, a diſtance that will do little (if any) injury to whatever grows in it, but which, by alternately and judiciouſly varying the crops, will improve both the corn and graſs for ever.

The leaves of no tree yet known, has ſo good an effect in compoſt ſoil for flowers, as that of the Poplar, nor will any ſo ſoon thicken the earth on which they grow, to which may be added, that of its being a very handſome chearful plant.

Thus, at a very inconſiderable expence, large tracts of waſte land in theſe kingdoms, that now remain barren, might, in a few years, be rendered beautiful, warm and fruitful. Should it not then be a reproach to the owners of theſe uncultivated places, that an experiment ſo eaſy and cheap, as putting a parcel of cuttings in the ground, in ſuch a manner, as here directed, is not tried? the ſucceſs of which is certain, and which, if judiciouſly practiſed by a few, would as certainly be followed by numbers, to a very great and general improvement.

The trembling Poplar does not grow to the magnitude of the other ſorts juſt treated of, and is therefore leſs proper for the purpoſes mentioned, but is, amongſt all the trees yet known, the fitteſt for planting by the ſides of rivers, to prevent their incroachments.

The wood of the Poplar is uſed for different purpoſes, by the turner, the cart-wright, and cooper for hoops; and that of the Abele (which is the beſt timber) is good both for flooring and wainſcotting rooms, being extremely white, and ſubject neither to ſplit, ſwell, or ſhrink: But notwithſtanding theſe good qualities, in grounds intended to produce good and clean graſs, I ſhould rather adviſe the white and Lombardy Poplar, as not ſubject to produce ſuckers, which the Abele does in ſuch abundance, as to deſtroy the graſs, or other crops, where the land is not annually cultivated: For theſe reaſons, this tree ought to be planted in proper ſituations, to run up quickly for timber, without any other conſideration.

The white Poplar with ſtriped leaves, is increaſed by budding it on the common white Poplar; but the variegation will be faint, if not planted in a thin poor ſoil.

The Lombardy Poplar has been but lately introduced into Britain; it is a fine chearful pyramidal plant, grows faſter than the common kinds, and affords an admirable ſhelter to every thing that ſurrounds it: It is propagated by cuttings, with equal eaſe as the others, and, ſo far as I have been able to obſerve, is as hardy, and will ſucceed in all the different kinds of land they do; ſo that, there appears great reaſon to believe, it will ſoon turn out a national benefit.

The black Carolina Poplar is a very graceful plant, but is far from being ſo hardy as any of the other kinds, their former year's ſhoot being ſubject to periſh in hard winters, or where they are much expoſed; therefore this tree ought to be placed in a well protected ſituation, and in a good deep, feeding, moiſt, but not wet ſoil: For tho' in their native climate, where the winters are not ſo long as ours, they are moſt commonly found in watery grounds, and by the ſides of rivulets, yet, from many repeated trials I have made, I find they will not ſucceed in ſuch places here; neither ought they to be planted in thin dry land, where frequent waterings in ſummer will be required to keep them alive. The young branches of this tree, which grow in an angular manner, are very ſingular: Their leaves are broader than any of the other ſorts; and, from their buds in the ſpring, iſſues a very ſweet balſam.

The Balſam Poplar was ſent in cuttings from Canada to Scotland five or ſix years ago, and being propagated with much eaſe, are now in the poſſeſſion of many. It is, of all the ſpecies, by far the moſt beautiful and magnificent plant. The leaves are very large, of a light chearful green, and the bark of a ſmooth ſhining browniſh colour. I have ſeen it in various ſoils, both wet and dry, and of a middling good quality, in all which it much exceeds the other ſorts in luxuriance of growth. Whether it will advance with equal facility as the common kinds, in very poor and expoſed ſituations, I ſhall not yet pretend to determine, as it has not been ſufficiently long amongſt us, to make the neceſſary experiments; but, from all the obſervations I have been able to make, it appears a hardy plant, from hence there is reaſon to hope, it will be an acquiſition of the higheſt importance, both in point of uſe and beauty to our foreſts; and ſhould I be indulged with health to purſue this proceſs, I have no doubt of confirming it, by undoubted proofs.

The berry-bearing Poplar was introduced at the ſame time, and in the ſame manner as the balſam kind. It is likewiſe a plant of much elegance, not quite ſo broad in the leaf as the other, but of a gay lighter green, with a whitiſh bark, and deeply furrowed.

However this I have to obſerve of this tree, that, having planted ſome of their cuttings in rich, and others in a poor and leſs cultivated ground, I have loſt a conſiderable number of the latter, while not one in an hundred has failed in the generous ſoil; from hence I conclude, that in making plantations of them in coarſe, barren, or cold ſituations, the nurſed plants are much more preferable than cuttings, which does not in the leaſt contradict their being very hardy when advanced in growth. But whatever their ſucceſs may be, in forbidden ſoils and climates, we have the ſtrongeſt motives to encourage them, for ornamental plantations, in ſituations that are favourable.

CHAPTER XVII.

THE *LOTE*, OR NETTLE TREE.

A Deſcription of its Flower and Seed.

It hath male and hermaphrodite flowers on the ſame tree: the hermaphrodite flowers are ſingle, and ſituated above the male. The empalement of the hermaphrodite flower is divided into five parts, in which there are no petals, but five ſhort ſtamina terminated by thick quadrangular ſummits, with four furrows. In the centre is ſituated an oval germin, ſupporting two reflexed ſtyles crowned by a ſingle ſtigma. The germin afterward becomes a round berry with one cell, incloſing a roundiſh nut. The male flowers have their empalements divided into ſix parts, and have no germin or ſtyle, but in other parts are like the hermaphrodite.

The SPECIES *are:*

1. The NETTLE TREE, with black fruit.
2. The NETTLE TREE, with purple fruit.
3. The NETTLE TREE, with large yellow fruit.
4. The Eaſtern NETTLE TREE, with larger leaves and fruit.

THE firſt of theſe trees is a native of Europe, the ſecond and third of America, and the fourth was diſcovered by the late Dr. Tournefort in the Levant, who ſent its fruit to the Royal Garden at Paris, where they were raiſed, and from thence ſoon introduced into the Britiſh gardens.

They are all of them ſufficiently hardy to bear our ſevereſt winters, and in ordinary ſituations, when of three or four years ſtanding, and, being a tree of admirable ſhade, beauty, and uſe, deſerves to be generally cultivated.

It may be raiſed either from ſeed, (which if you can procure, is the beſt method), or by layers: If from ſeed, ſow them in the ſpring, ſoon after they are ripe, (which is commonly in January), about a foot deep, in pots or boxes, with the bottom pierced into holes, covered with oyſter-ſhells or broken tyles, laying three or four inches of rough ſtoney gravel over them, to let off the moiſture, and prevent the earth from becoming heavy and ſour: Then fill the pots or boxes, with a rich looſe compoſt mould, within an inch of the top; ſow the ſeed, and ſift over them, half an inch more, of the ſame quality of earth. Few of theſe ſeeds will appear until the following ſpring; but the pots or boxes muſt not be ſunk in the ground, as is too commonly practiſed, in order to keep them moiſt; it is beſt to water them, keeping the pots out of the ground, as then the water is not detained, which would rot the ſeed and plants more, than any other ill management; beſides, ſuch as eſcaped, would be poor, ſtarved, and ſtunted: Therefore, let the pots be ſet on ſtones or logs of wood, and placed where they may receive the morning ſun only, until autumn, when they ſhould be removed under a ſouth wall, and continue there until the weather becomes ſevere, when they muſt be put under a covered frame, conſtantly removing the glaſſes or other covering in mild weather. About the beginning of the following April, remove the boxes to their firſt ſituation, when you muſt looſen the ſurface gently with your fingers, picking away the foggy or mouldy parts, and ſift on a little freſh earth in proportion to what you have taken off. About the end of April, moſt of the plants will have appeared above ground, when they muſt be frequently but moderately watered in the evenings in mild weather, but in the mornings when inclined to froſt, to be kept perfectly clean during the ſummer months, and protected as in the preceding winter, in ſevere weather.

The plants being a year old, raiſe them carefully out of the boxes, ſhorten their downright roots, and manage them as directed for the Tulip-tree, while in the nurſery; with this culture they will very well agree, and which muſt be purſued until planted where they are to remain for good.

If you intend to propagate them by layers, let this be performed about the end of September, or early in October, as ſoon as their leaves begin to tarniſh. The wood of this tree being extremely hard, they will not have ſufficiently rooted until the ſecond year, unleſs the ſummer has been uncommonly wet, or you aſſiſted them with regular and plentiful waterings; therefore, if you intend to ſave a ſeaſon, let this be particularly attended to.

About the end of March, or beginning of April, when you find they have ſufficiently rooted, take away the earth from about the layers, of which be very tender, and with a ſharp knife cut it off beyond the joint, where, if properly laid, the roots will principally appear; prune away all but the ſtrongeſt and ſtraighteſt ſhoot, and plant them in a nurſery of good freſh ſoil, in rows, at two and a half feet diſtance, and a foot aſunder in the row; give them frequent waterings until the roots are well eſtabliſhed; keep the ground clean, digging it between the rows in autumn and ſpring, and let them remain here two years.

Theſe trees may now be either planted out for good, or removed to another nurſery, cutting off the extremities of their roots, and all ill-placed branches, and placed in rows three and a half feet diſtant, and eighteen inches in the row, treating them as formerly, and letting them remain for three years.

The Nettle Tree will ſucceed in any ordinary land, but moſt delights in a deep moiſt ſoil, where they will ſoon become ſtately trees, with fine regular ſpreading heads, of a chearful green, which renders them extremely proper, either for clumps in parks, or ſingle trees to ornament our avenues.

Next to the *Platanus* this plant was moſt eſteemed by the Romans, both for its grateful ſhade, and *immortal* timber, as they ſtiled it. Of this the vaſt ſum offered by Craſſus to Domitius for half a dozen of them, then growing about his houſe in Rome, is an inconteſtible proof. It is doubtleſs amongſt the hardeſt wood of any we know: It was formerly uſed for pipes, and all kinds of wind-inſtruments; and the roots make excellent handles for knives, with many different kinds of tools that require ſtrength and ſolidity.

CHAPTER XVIII.

THE *LABURNUM*, or BEAN-TREFOIL.

A Deſcription of its Flower and Seed.

It hath a butterfly flower, with a ſhort bell-ſhaped empalement of one leaf, divided into two lips, the upper being bifid and acute, the under indented in three parts. The ſtandard of the flower is riſing, oval, and reflexed on the ſides. The wings are obtuſe, erect, and the length of the ſtandard. The keel is bellied and acute. It hath ten ſtamina, nine joined, and one ſtanding ſeparate, terminated by riſing ſummits. It hath an oblong germin, ſupporting a ſingle ſtyle, crowned by an obtuſe ſtigma. The germin afterward becomes an oblong blunt pod, narrow at their baſe, filled with kidney-ſhaped flatted ſeeds.

The SPECIES *are:*

1. The broad-leaved LABURNUM.
2. The narrow-leaved LABURNUM, with long pendulous flowers.
3. The broad-leaved LABURNUM, with very ſhort pendulous flowers.

THESE trees are propagated by ſowing their ſeeds (which they annually produce in abundance) in March, on a bed of freſh earth, covering them about half an inch deep; and, in four or five weeks, the plants will appear above ground, when ſome gentle waterings in dry weather will much promote their growth.

The following February or March, remove them from the ſeed-bed to the nurſery, when you muſt ſhorten their roots, which are naturally carroty, but which may be cut freely while young; plant them in lines, two feet and a half diſtant, and a foot aſunder in the line; to be kept clean; dig the ground between the lines in autumn and ſpring, here to remain for two ſeaſons.

From hence remove them, in October or February, to another quarter; ſtill continue to reduce the roots that incline downwards, and ſmooth the extremities of thoſe that ſpread, pruning off all ill-placed lateral branches, obſerving to leave ſome of the ſmalleſt at proper diſtances, to proportion the encreaſe of the ſtem; for this tree, by making prodigious ſhoots in the head, when the ſide-branches are cut off, bends with its own weight, and is afterward with difficulty recovered to a good form. This being properly performed, plant them in lines, five feet diſtant, and two feet aſunder in the line; manage them as formerly directed, and prune them annually to preſerve their form; in which ſituation they may remain three or four years, when they will produce their flowers, and make an agreeable appearance in whatever plantation you place them.

It ſeems to me ſomewhat ſtrange, that the *Laburnum* has not been univerſally cultivated in our plantations, it being a tree of admirable beauty in May when in bloom, propagated with the greateſt eaſe, and at the ſmalleſt expence. It will ſucceed in various ſoils, and even in that which is very poor and hungry; but where there is any conſiderable depth of tolerable mould, the progreſs it makes is amazing. Though I do not remember to have heard the quality of the wood recommended by any author, yet I am well aſſured it is very valuable for ſundry purpoſes, and by ſome preferred even to mahogany, for its ſolidity and beautiful colour, which is a bright yellow, veined with dark purple; and I have ſeen a large table and a dozen chairs of it, in the poſſeſſion of a noble Lord, which good judges of elegant furniture, thought the fineſt they had ever ſeen.

I have one further hint to communicate in favour of this plant, which alone entitles it to our attention, which is, that by mixing them in ſuch plantations as are infeſted with hares, that while a twig of them remains, no other plant will be touched, and though eat to the ground every winter, they will ſpring with additional vigour the ſucceeding ſummer, and conſtantly ſupply theſe animals with a luxuriant food. This, to my certain knowledge, may be depended on; and the produce of five ſhillings worth of ſeed, properly raiſed and diſtributed, will furniſh plants ſufficient to protect 500,000 other trees. Many expenſive and laborious experiments have been ineffectually tried to protect young plantations from this enemy of theirs, of which not any will be found more effectual than this cheap and no leſs certain remedy; and, however ſimple the diſcovery may appear, the effects of it will be of the higheſt uſe to every planter, who puts it in practice.

CHAPTER XIX.

THE ALDER TREE.

For a Character of this Species, we are referred by Mr. Miller, to the Tribe he includes under the Name Betula, (the Birch Tree,) which you will find in the next Article.

THIS tree delights in wet boggy land, and will even grow where water conſtantly ſtands, but, if planted in dry-ground, is moſt pernicious and devouring, for, by attracting all the moiſture and generous juices from the earth, it will ſoon render it totally barren. Some years ago, vaſt numbers of theſe plants were brought from Holland to this country, at a conſiderable expence, and unhappily for the owners, planted in large tracts of moiſt land, from whence no returns ſuitable to the labour and expence have been received. Had the ſame money been beſtowed on planting Poplars and Abeles, they would by this time have highly increaſed the value of ſuch eſtates, and become a general improvement; whereas the injudicious choice of this tree has proved a diſcouraging circumſtance to many young planters, and probably deterred others from engaging in improvements of this kind, when abundant might have been their advantage, as well as contribute to their pleaſures, by making a judicious choice, for which I ſhall endeavour to give ſome inſtructions, collected not from caprice and fancy, but from the beſt of human inſtructors, *Experience*.

They are eaſily propagated by layers, or by cuttings of three, four, or five years growth, planted in February or March; but being a tree of a melancholy appearance, I choſe to ſay no more of it, as ſundry aquatics, of greater beauty and value, will grow abundantly faſter in the ſame ſituations they like; and it is only to warn the unexperienced planter againſt the frequent uſe of them, that I have taken any notice of a tree I ſo much diſlike.

CHAPTER XX.

THE BIRCH TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers, at ſeparate diſtances on the ſame tree; the male flowers are collected in a cylindrical catkin, which is ſcaly, looſe, and imbricated on every ſide, each ſcale having three flowers, which have two minute ſcales on the ſide. The flower is compoſed of three equal florets, fixed to the empalement by a ſingle ſcale; each floret is of one leaf, divided into four oval ſegments which ſpread open; theſe have four ſmall ſtamina, crowned by double ſummits. The female flowers grow in a catkin, in the ſame manner as the male. The common catkin is imbricated, having three ſcales which are every way oppoſite, faſtened to the central ſtring or axis, having two heart-ſhaped flowers pointing toward the apex, where it is ſituated. They have no viſible petals, but a ſhort oval germin, ſupporting two briſtly ſtyles, which are the length of the ſcales of the empalement, and crowned with a plain ſtigma. It hath no pericarpium, but the ſeeds are included in the ſcales of the catkin, which are oval and winged.

The SPECIES *are:*

1. The common BIRCH TREE.
2. The Poplar-leaved BIRCH TREE.
3. The Canada BIRCH TREE.

THE common Birch may be propagated either from ſeed, or ſuckers taken from the roots of old trees, but ſeedlings make the handſomeſt and beſt-rooted plants. I ſhall therefore firſt direct their culture, which, though one of the hardieſt and moſt common trees our climate produces, (of which it is a native), yet is it ſeldom ſucceſsfully raiſed from ſeed, which is generally owing to too much covering in the ſeed bed, and which it will by means bear, as the plants, when they firſt vegetate, are very delicate, and unable to force their way through any conſiderable depth of ſoil; but by obſerving the following ſimple practice, you will procure them in abundance.

The ſeeds of the Birch are ripe about the end of September or the beginning of October, when, having gathered them in a fair clear day, ſpread them thin on a loft floor until dry; after which, mix them with looſe ſand, and keep them in an airy place until the beginning of the following March. The ground for ſowing them, which ought to be freſh and light, having been trenched or dug the preceding autumn, muſt now be pointed over, making it as looſe as poſſible, and raked very fine, to be divided into beds, three and a half feet wide; ſow the ſeeds, and preſs them into the ground with the back of a ſpade, without throwing any earth over them. If the weather is moiſt and mild, no further care is neceſſary; but if dry and froſty, which is often the caſe at this ſeaſon, lay a little peaſe-haulm over the beds, for three or four weeks, which will keep the ground moderately moiſt, forward their vegetation, and defend them from being injured by froſt, or deſtroyed by birds, who are very fond of them. About this time uncover the beds, keep the ground quite clean, and give them three or four gentle waterings about *noon*, from the middle to the end of April, the weather being mild and dry; which repeat more plentifully and frequently from thence until the middle of June, in mild *evenings*, when they will require no further attention.

The following March, remove theſe plants from the ſeminary to the nurſery, ſhortening their top-roots, and plant them in lines, two and a half feet diſtant, and about ten or twelve inches aſunder in the lines; to ſtand two years, if the land is good, and the plants have grown freely; but if in a poor thin ſoil, where their progreſs has been but ſmall, they may continue three years; when, after the ſecond year's growth, in the month of March, cut down ſuch cloſe to the ground as are the leaſt thriven or crooked, when they will produce ſtraight and vigorous ſhoots.

Thoſe taken from the roots of old trees, or ſeedlings grubbed up from the woods, cannot have ſo good roots or free ſhoots as plants raiſed in a clean well cultivated nurſery-bed, therefore they will require more time and attention, to make them equally good: For this purpoſe, having procured plants with all the roots you poſſibly can, ſhorten ſuch as incline to run downward; cut away the broken or bruiſed, with all the muſty parts contracted in the woods, for want of air; reduce likewiſe the tops of ſuch as are too tall or heavy-headed, and lay them in drills cut down with the ſpade, at the ſame diſtances directed for the ſeedlings, and in depth proportioned to the ſize of the plants; the moſt certain rule for which, is to follow nature, and place their fibres to the depth they were in the woods, water them at planting, keep the ground clean, and dig between the lines in the ſpring. Having ſtood here two years, cut them down to the ground, to remain two years longer, when they may be removed for good.

The ſecond and third ſorts will bear our winters tolerably well, when mixed with and ſheltered by other trees: They may be propagated either by layers, or budding them on the common kind; but the raiſing them from ſeed brought from America, is attended with great uncertainty, as it will not vegetate, if kept long out of the ground.

The Birch is a handſome plant; and though the wood is not amongſt the moſt valuable, yet it is uſeful for various purpoſes; as well as for ploughs, and other inſtruments of huſbandry.

The late Earl of Hadinton, the greateſt, moſt judicious, and ſucceſsful planter of his time in this country, (Scotland), with great propriety calls the Birch an amphibious plant, as it grows in rich and poor, wet and dry, ſandy or rocky ſituations, not refuſing any ſoil or climate; and its fragrant ſmell after rains, juſtly intitles it to a place in the wilderneſs; to which I ſhall only add, that by wounding the tree in the ſpring, a large quantity of juice may be extracted, that when fermented, becomes a ſpirituous, delicious, and wholeſome liquor.

CHAPTER XXI.

The SERVICE TREE.

A Deſcription of its Flower and Seed.

The flower has a ſpreading, concave, permanent empalement of one leaf, indented in five parts; it has five roundiſh concave petals, which are inſerted in the empalement, and above twenty awl-ſhaped ſtamina, which are alſo inſerted in the empalement, terminated by roundiſh ſummits. The germin is ſituated under the flower, ſupporting three ſlender ſtyles crowned by erect headed ſtigmas; it afterward becomes a ſoft umbilicated fruit, incloſing three or four oblong cartilaginous ſeeds.

The SPECIES *are:*

1. The true SERVICE TREE.
2. The manured SERVICE TREE.
3. The Maple-leaved SERVICE TREE.
4. The Virginian wild SERVICE, with leaves like the Strawberry tree.
5. The common wild SERVICE TREE.
6. The White BEAM, or AREE THEOPHRASTI.
7. The Quick BEAM, in *England* commonly called the MOUNTAIN ASH, in *Scotland* the ROWAN TREE.
8. The Quick BEAM, with ſtriped leaves.

THESE plants, though not uſually propagated for common Foreſt-trees, are yet well worth our attention in all collections for ornament; and for their ſweet ſmelling bloſſoms produced early in ſummer, and their large bunches of bright red fruit in autumn, which have a very pleaſing effect in the wilderneſs, or in clumps in parks, lawns, &c.

They are all propagated by ſowing their ſeed; but that of the four ſorts firſt mentioned, like many other fruits, ſeldom produce plants of equal goodneſs with thoſe from whence the ſeed is taken; therefore, in order to preſerve the different ſpecies, they muſt be increaſed by layers, or budding or grafting them on the common ſorts, or Pear-ſtocks. Theſe budded or grafted will make much finer plants than the layers, and on the Pear-ſtock they will ſooner become fruitful, and bear fairer fruit than on ſtocks of their own ſpecies. I ſhall therefore proceed to the other kinds, of which I have raiſed great numbers from ſeed, without any ſenſible variation from the parent tree.

Having gathered the berries in October, diveſt them of the pulp, by rubbing them between your hands in water, and after that with ſand, in which preſerve them until the firſt dry weather in ſpring, and ſow them on beds of rich well-prepared looſe earth, three and a half feet broad, covering them to the depth of an inch. Few of theſe ſeeds will appear above ground until the following ſpring, but the beds muſt notwithſtanding be kept perfectly clean, during the ſummer months; and as ſoon in February as the weather will admit, with a ſhort-toothed rake, dreſs and looſen the beds, throwing on as much freſh ſoil, as you have taken off of the hard and ſoggy ſtuff; the beginning of April, the weather being dry and not froſty, gently water them, once a week in the mornings until July, which will much encourage their growth.

From the ſeed-bed remove them the following ſpring, but obſerve to ſhorten their top-roots, and plant them in a rich well-prepared ſoil, in rows two feet diſtant, and a foot aſunder in the row, where they ought to remain two years, keeping the ground clean in ſummer, and digging between the lines in ſpring and autumn.

Having ſtood here two ſeaſons, remove them to another nurſery, cutting away all croſs downright or ſuperfluous roots; but be ſparing of thoſe that ſpread horizontally, and only ſmooth them at their extremities: Plant them at three and a half feet by eighteen inches aſunder, treating them as formerly, to remain for three years, when they will be of a proper ſize to remove, where they are intended to continue for good.

Though the fifth, ſixth, and ſeventh ſorts, will anſwer for ſtocks to bud the others on, yet of theſe, the White Beam will make the beſt plant, which however is excelled by the Pear-ſtock; therefore, ſuch as are intended to be budded, ſhould be the moſt vigorous plants of a year's growth, and that have been planted in a generous ſoil, at the diſtance of three feet by fourteen or ſixteen inches; to be budded the ſecond ſummer after removal, then to ſtand two years longer, when they may be removed for good.

The Quick Beam with ſtriped leaves, muſt likewiſe be increaſed by budding, and ſucceeds beſt on ſtocks of its own kind.

Theſe trees in general, affect a ſtrong moiſt ſoil, though the fineſt plants of the Quick Beam I have ever ſeen, were on a dry elevated ground; Their wood is much uſed by the wheel-right, as well as for many purpoſes of huſbandry, and is excellent for fuel: Their berries are the moſt tempting to the black birds and thruſhes, who will never fail to give their company ſo long as they laſt.

CHAPTER XXII.

THE JUDAS TREE.

A Deſcription of its Flower and Seed.

It hath a ſhort bell-ſhaped empalement of one leaf, which is convex at the bottom, and full of honey liquor; at the top it is indented in five parts. The flowers hath five petals, which are inſerted in the empalement, and greatly reſembles a papilionaceous flower. The two wings riſe above the ſtandard, and are reflexed; the ſtandard is of one roundiſh petal, and the keel is compoſed of two petals, in form of an hart, which incloſe the parts of generation. It hath ten diſtinct ſtamina, which decline, four of which are longer than the reſt, and are terminated by oblong incumbent ſummits. It hath a long ſlender germin, ſitting upon a ſlender ſtyle, crowned by an obtuſe ſtigma; the germin afterward becomes an oblong pod with an oblique point, having one cell, incloſing ſeveral roundiſh compreſſed ſeeds.

The SPECIES *are:*

1. The common JUDAS TREE.
2. The Canada JUDAS TREE.
3. The Carolina JUDAS TREE, with pointed leaves.

THE firſt of theſe is a native of the warmer parts of Europe, and abounds in Italy, Spain, and the ſouthern parts of France.

The ſecond ſort is common in Virginia, New-England, Canada, and moſt of the northern countries of America, where it is called the Red Bud, from the beautiful colour of its flower-buds.

The third ſort is a common plant in the woods of Carolina, but differs from the other two, in the form of its leaves, which are pointed, the former being nearly round; the flowers of this too are ſmaller, and the plants, for three or four years, require a little more ſhelter in caſe of hard winters, after which, they will bear our climate perfectly well, in an ordinary ſituation.

Theſe trees may be propagated by layers, which will produce plants ſufficiently handſome, provided they are properly trained; but ſeedlings are to have the preference, and the more ſo, when they are raiſed from the ſeed of their native ſoil.

As ſoon as the ſeed is either received from abroad, or gathered at home, let it be dried and mixed with ſome looſe ſand, and preſerved from froſt and wet, until the middle or latter end of March, as the weather is more or leſs favourable. About this time, ſow them on a bed of rich mellow dry ſoil, to be covered half an inch deep. In four or five weeks, the plants will begin to appear, when the bed ought to be hooped over and covered with mats, to protect them from the cold froſty winds, frequent at that ſeaſon, the exceſſive rains which ſometimes burſt them, and in the warm ſeaſon, to ſcreen them from the ſcorching heat of the ſun, which will much accelerate their growth. From their appearance above ground, they muſt be gently though frequently watered in the mornings, while the weather continues cold, but afterwards in the evenings when mild. In this ſituation they will require no more attendance, than, in caſe of a ſevere winter or ſtorms, to lay mats over them, removing them regularly as the air becomes temperate.

The ſucceeding ſpring, as ſoon as the buds begin to ſwell, remove the plants from the ſeminary, to a nurſery of the ſame kind of well-prepared looſe ſoil; ſhorten the top-roots, and plant them in rows two feet and a half diſtant, and about a foot aſunder in the row; give them a gentle watering, which ought to be frequently repeated, in the evenings of dry weather, during the ſummer months, and keep the ſoil about them clean and mellow. Theſe trees grow naturally in a wild irregular manner, and, when left to unaſſiſted nature, are rather of the buſhy Shrub kind. To correct this defect, place a ſtake by the ſide of each plant; and as it advances, tie the leading ſhoot to it, with a piece of ſoft baſs, which direction it will afterwards retain, and grow ſtrait and regular. In caſe the following winter ſhould prove ſevere, it will be neceſſary to lay ſome peaſe-ſtraw over the roots, which in the ſpring, may be dug into the ground between the rows. At this ſeaſon let all the low-growing branches, of the former year, be cut away, that they may not impede the vigorous growth of the leading ſhoot, which muſt be conſtantly tied to the ſtake, as it advances, obſerving to regulate this pruning, ſo as not to draw the ſtem too much, but to leave ſuch a number of branches as will retain the ſap for its proper nouriſhment, that it may advance with bulk proportioned to its height. If theſe circumſtances are attended to, the plants will only require the additional trouble of keeping them clean, during their abode here.

The Judas Tree ſhould not remain longer than two years, in the ſame nurſery from the ſeed-bed, and therefore, the ſucceeding ſpring, they either may be planted out where they are to remain, or (which I would rather adviſe) committed to another nurſery, and planted at greater intervals, for two years longer, where they may be treated in the ſame manner, as has been directed; by which time, they will be large, handſome, and hardy plants.

Though the above method of culture, is the cheapeſt and eaſieſt, for raiſing great numbers of them, yet ſuch gentlemen as are above the conſideration of a trifling expence, and would promote their growth as faſt as poſſible, I would recommend the following method to be purſued, as it will make the plants double the ſize of thoſe raiſed in the natural way.

For this purpoſe, the beginning of March, let the ſeed be ſown thin in penny-pots, plunge them to their rims in a moderate hot-bed of tanners bark, and this in preference of one of horſe-dung; as the heat of the bark is more equal, laſting, and has leſs ſteam ariſing from it. When the ſeed has been a week ſown, it muſt be very gently watered, every third or fourth day; but as ſoon as the plants come above ground, every ſecond day, and the quantity of water increaſed as they advance in growth. When the plants are about five or ſix inches high, which you may expect they will be about the beginning of May, draw out the ſtrongeſt and plant them in ſeparate penny-pots, and plunge them again into another moderate hot-bed, watering them frequently and plentifully, covering the glaſſes with mats in the heat of the day, when the ſun ſhines, to prevent their being ſcorched, admitting a proper quantity of air, that they may not be over-drawn. In this ſtate they may remain until about the firſt of Auguſt, when the bark will have loſt moſt of its heat, the pots are then to be taken out of the bark, but ſtill kept in the frame, but more and more expoſed to the open air, until the glaſſes are entirely taken away, during the mild weather of the autumn months. On the approach of winter, the glaſſes muſt be again replaced on their frames, to protect the plants in ſtormy weather; taking every opportunity to expoſe them to the open air, when the ſeaſon is temperate.

The following ſpring, let the ſmall plants that were left in the pots, be carefully ſhaken out and ſeparated, ſo as not to injure their tender roots; cut away with a ſharp knife, the extremities of their downright and ſtraggling roots, and put them in ſeparate pots of the ſame ſize; plunge them again with the others, that were re-potted the preceding ſummer, in a freſh tan-bed, until the month of July, by which time they will have made vigorous ſhoots; inure them by degrees to the air, and treat them as in the former year; only obſerve as the plants become much ſtronger, and of courſe more hardy, that they are more ſuddenly expoſed to the open air, from which they will not require ſo much protection the following winter, even in hard weather.

When the ſap begins to riſe, the ſucceeding ſpring, carry theſe pots to the quarter of the nurſery, where you intend to plant them, which ſhould be as nearly as you can in ſuch a ſoil, as has been directed for the ſeedlings, and ſheltered a little by trees or hedges; make pits with a ſpade, at three feet diſtance by two, as deep, but ſomething wider than the pots, from which ſhake them out carefully with their whole balls of earth, which may be eaſily done without injuring their ſmalleſt roots, then ſet them upright, but no deeper than they ſtood before; give them a plentiful watering; prune away the under branches, and any others that are ill-placed, and fix a ſtrong ſtake by ſuch of them as incline to be crooked, to which tie the leading ſhoot; and in this ſituation let them remain two years, digging the ground about them in autumn and ſpring, continue to prune away all ſuperfluous ill-placed branches, when you may tranſplant them to the places intended, where they are to remain for good.

By attending to what has been directed for the propagation of this plant, it may be raiſed with ſuch abundance of roots, as not to retard its growth, or feel the ſmalleſt check from a removal.

If I have been tedious in directing the management of the Judas Tree, it is on account of its ſingular elegance and beauty, when aſſiſted by a proper culture, which is far from being generally known; and I cannot help thinking, it is from a general ignorance, we ſee it ſo very little propagated, even by men of knowledge in gardening. In its natural ſtate, it grows in an irregular ſtraggling manner; but by leading the principal ſhoot, as is directed, it may be eaſily elevated to the height of twenty-five feet or more. The flowers are of a beautiful red, tinged with crimſon and purple; the leaves, a fine deep green, large, and nearly round. The flowers appear before the leaves are expanded, and, in well-grown trees, are ſo numerous as almoſt to cover the branches, which renders it one of the greateſt beauties of the ſpring.

CHAPTER XXIII.

The ELDER TREE.

A Deſcription of its Flower and Seed.

The flower has a ſmall permanent empalement of one leaf, cut into five parts; it has one concave wheel-ſhaped petal, cut into five obtuſe ſegments at the brim, which are reflexed, and five awl-ſhaped ſtamina the length of the petal, terminated by roundiſh ſummits, which are an oval germin ſituated under the flower, having no ſtyle, in the room of which is a ſwelling, crowned by three obtuſe ſtigmas. The germin afterward becomes a roundiſh berry with one cell, including three angular ſeeds.

THIS tree is ſcarcely ever planted but for the ſake of its berries, of which ſome make wine, as well as uſe them for other purpoſes; but it has other good qualities to recommend it than theſe, for in cold barren climates and ſoils, it becomes a valuable plant.

It will grow amazingly faſt in wet and dry, cold and warm, and indeed in all kinds of ſoils, and in the moſt forbidding ſituations, where thorns and the better kinds of hedge plants will not ſucceed, and with no other trouble than ſetting ſtakes in the earth, of four, five, or ſix years growth, and about three feet high, planted a foot deep, and about a foot aſunder, and in three years you will have hedges that will reſiſt the wildeſt cattle, and by their warmth, much improve the ground. Theſe hedges being cut cloſe to their trunks every third or fourth year, they will branch out more numerouſly than ever, and afford a conſtant ſupply of fuel, which, in many ſituations, will prove a bleſſing to the poor inhabitants. It might alſo be uſed to much advantage in better ſituations, where plantations of the moſt valuable Foreſt-trees are intended, by planting them in thick lines in the moſt expoſed places of the field, where, by their quick growth, they would afford protection againſt tempeſtuous and froſty winds, and highly contribute to the ſpeedy advance of ſuch plantations; and the Elders may be cut away by degrees, as the other trees advance.

However much this plant is generally diſregarded, it is notwithſtanding a handſome chearful tree, and, when covered with its numerous cluſters of white flowers in ſpring, and purple berries in autumn, has a very agreeable effect in lawns, clumps, *&c.* But I would by no means adviſe its being promiſcuouſly planted in the wilderneſs or foreſt with other trees, as their creeping roots extend a great way, and would rob the plants near them of their proper nouriſhment; neither ſhould they be placed in any great number near our dwellings, as the ſtrong ſcent emitted from their flowers would occaſion pains in the head; but, for the firſt-mentioned purpoſes of nurſing other plants, diſpoſed at proper diſtances, they deſerve our warmeſt attention.

A Letter from Mr. Chriſtopher Gullet to Matthew Maty, M. D. Sec. R. S. on the Effects of ELDER, *in preſerving Growing Plants from Inſects and Flies.—From the Philoſophical Tranſactions.*

SIR,

I SHOULD not preſume to trouble you, as a member of the royal ſociety, with the following letter, did not the ſubject ſeem to promiſe to be of great public utility. It relates to the effects of Elder, in the preſervation of different crops, &c.

1ſt. In preſerving cabbage plants from being eaten or damaged by the caterpillar.

2d. In preventing blights, and their effects on fruit and other trees.

3d. In the preſerving of crops of wheat from the yellows, and other deſtructive inſects.

4th. Alſo in ſaving crops of turnips from the fly, &c. &c.

1ſt. I was led to my firſt experiments, by conſidering how diſagreeable and offenſive to our olfactory nerves the effluvia emitted by a buſh of green Elder leaves are, and from thence, reaſoning how much more ſo, they muſt be to thoſe of a butterfly, whom I conſidered as being as much ſuperior to us in delicacy, as inferior in ſize. Accordingly I took ſome twigs of young Elder, and with them whipt the cabbage plants well, but ſo gently as not to hurt them, juſt as the butterflies firſt appeared; from which time, for theſe two ſummers, though the butterflies would hover and flutter round them like gnomes or ſylphs, yet I could never ſee one pitch, nor was there I believe a ſingle caterpillar blown, after the plants were ſo whipt; though an adjoining bed was infeſted as uſual.

2d. Reflecting on the effects above-mentioned, and conſidering blights as chiefly and generally occaſioned by ſmall flies, and minute inſects, whoſe organs are proportionably finer than the former, I whipt the limbs of a wall plum-tree, as high as I could reach; the leaves of which were preſerved green, flouriſhing, and unhurt, while thoſe not ſix inches higher, and from thence upwards, were blighted, ſhrivelled up, and full of worms. Some of theſe laſt I afterwards reſtored by whipping and tying up ſome Elder in their branche. It muſt be noted, that this tree was in full bloſſom at the time of whipping, which was much too late, as it ſhould have been done once or twice before the bloſſom appeared. But I conclude from the whole, that if an infuſion of Elder was made in a tub of water, ſo that the water might be ſtrongly impregnated therewith, and then ſprinkled over the tree, by a hand engine, once every week or fortnight, it would effectually anſwer every purpoſe that could be wiſhed, without any poſſible riſk of hurting the bloſſoms or fruit.

3d. What the farmers call the yellows in wheat, and which they conſider as a kind of mildew, is in fact, as I have no doubt but you well know, occaſioned by a ſmall yellow fly with blue wings, about the ſize of a gnat. This blows in the ear of the corn, and produces a worm, almoſt inviſible to the naked eye; but, being ſeen through a pocket microſcope, it appears a large yellow maggot, of the colour and gloſs of amber, and is ſo prolific, that I counted very diſtinctly 41 living yellow maggots or inſects, in the huſk of one ſingle grain of wheat, a number ſufficient to eat up and deſtroy the corn in a whole ear. I intended to have tried the following experiment ſooner; but the dry hot weather brought on the corn faſter than was expected, it had got into fine bloſſom before I had an opportunity of perfecting my intention; however, the next morning at day-break, two of my ſervants took two buſhes of Elder, and went one on each ſide of the ridge, from end to end, and ſo back again, drawing the Elder over the ears of corn, of ſuch fields as were not too far advanced in bloſſom. I expected, that the diſagreeable effluvia of the Elder, would effectually prevent thoſe flies, from pitching their tents in ſo noxious a ſituation; nor was I diſappointed, for I am firmly perſuaded that no flies pitched or blowed on the corn after it had been ſtruck. But I had the mortification of obſerving, the evening before it was ſtruck, that the flies were already on the corn, (ſix, ſeven, or eight, on a ſingle ear) ſo that what damage had happened, was done before the operation took place; for, on examining it the following week, I found the corn, which had been ſtruck, much more free of the yellows, than what had not. I have, therefore, no doubt, but that, had the operation been performed ſooner, the corn would have remained totally clear and untouched. However ſimple the proceſs, I flatter myſelf, it bids fair to preſerve the corn from deſtruction, as this ſmall inſect is its greateſt enemy. One of thoſe yellow flies, laid eight or ten eggs of an oblong ſhape on my

thumb,

thumb, only while on the wing to croſs three or four ridges, which were only diſcoverable by viewing them with a pocket microſcope.

4th. Whole crops of turnips are frequently deſtroyed, by being bitten by ſome inſect; this I flatter myſelf might be effectually prevented, by having an Elder buſh ſpread, ſo as to cover the breadth of a ridge, and drawn once forward and backward, by a man over the young turnips. I am confirmed in this opinion, for having drawn an Elder buſh over a bed of young collyflower plants, which the flie had attacked, and would have totally deſtroyed, had I not uſed the Elder.

In ſupport of my opinion, I beg leave to mntion the following fact, from very credible information; about eight or nine years ago, this country was ſo infeſted with cock chafers or oakwebs, that in many pariſhes they eat up every thing green, but Elder. In this general devaſtation, a thought occurred to me, whether the Elder, now eſteemed noxious and offenſive, may not be one day ſeen entwined in the branches of our fruit trees, in order to preſerve their fruit from deſtruction by inſects: And whether the ſame means, which produced theſe ſeveral effects, might not be extended to a great variety of other caſes, in the preſervation of the vegetable kingdom.

The dwarf Elder (Ebulus), I apprehended emits a more offenſive effluvia than the common Elder, therefore muſt be preferable for this operation.

On mentioning my obſervations of the effects of Elder on corn crops, to Sir Richard William Bampfylde, he perſuaded me to publiſh them, which determined me to tranſmit them to the ſociety incorporated for promoting the knowledge of natural things, as well as uſeful experiments, in which they have ſo happily and amply ſucceeded, to the unſpeakable advantage and improvement of the world, which has occaſioned me to trouble you.

I have the honour

to ſubſcribe myſelf,

Sir, your moſt obedient,

and humble ſervant,

CHR. GULLETT.

To Dr. Maty,
Secretary to the
Royal Society.

CHAPTER XXIV.

THE TACAMAHACA TREE.

A ſpecies of the Poplar, whoſe leaves are almoſt heart-ſhaped, hoary on their outer ſide, and the inner of a dark green. See Poplar tree, for a deſcription of the flower, &c.

THIS tree grows ſpontaneouſly on the continent of America, where the inhabitants wound their ſtems in the ſpring, from whence flows a balſam, much eſteemed by the phyſicians in thoſe countries; this tree is ſufficiently hardy to bear our ſevereſt winters.

It is eaſily propagated by cuttings, planted about the middle of February, in a rich mellow earth, ſhaded from the mid-day ſun, and watered in dry weather, where, in one year, if the cuttings are ſtrong, they will grow upwards of three feet.

The ſucceeding February, remove theſe cuttings to a nurſery of a pretty deep ſoil; ſmooth the extremities of their roots; cut off the ſtrong ſide branches, and plant them in rows, three feet diſtant, and eighteen inches aſunder in the row; give them a plentiful watering; keep the ground clean; dig between the rows in autumn; and let them continue in this nurſery two or three years, when they may be tranſplanted to the places where they are intended to remain.

This is a quick-growing graceful plant, and juſtly claims a place in the wilderneſs, or other ornamental plantations. The leaves are long, thick, and of a bright ſhining green, with their under ſides of a lively ſilver hue, which, when waving with the wind, makes an agreeable diverſity. The buds are covered with a dark glutinous balſam, which ſmells very ſtrong, and adheres to the fingers on touching them; they are of the number of the earlieſt plants that give us notice of the approach of ſpring. They will grow in any ordinary ſoil, but moſt affect that which is mellow and deep. Where there are any void ſpaces in the wilderneſs, occaſioned by the death of any of your trees, this plant ſuffered to grow in its natural ſtate, (which is thick and buſhy) will ſooner ſupply theſe defects, than moſt others.

EVERGREENS.

CHAPTER XXV.

THE PINE TREE.

A Deſcription of its Flower and Seed.

The male flowers are collected in a ſcaly conical bunch, they have no petals, but many ſtamina, which are connected at their baſe, but divided at the top, terminated by erect ſummits; theſe are included in the ſcales, which ſupply the want of petals and empalements. The female flowers are collected in a common oval cone, and ſtand at a diſtance from the male on the ſame tree. Under each ſcale of the cone is produced two flowers, which have no petals, but a ſmall germin ſupporting an awl-ſhaped ſtyle, crowned by a ſingle ſtigma. The germin afterward becomes an oblong oval nut, crowned with a wing, included in the rigid ſcale of the cone.

The SPECISS *are:*

1. The Scotch PINE, commonly called the Scotch FIR TREE.
2. The manured PINE TREE.
3. The PINASTER, or wild PINE TREE.
4. The large Stone PINE TREE.
5. The ſmaller Stone PINE TREE.
6. The Cluſter PINE TREE.
7. The Eaſtern PINE TREE.
8. The Swamp PINE TREE, with long narrow leaves.

9. The Jerſey Pine Tree.
10. The Virginian Pine Tree, with long narrow leaves, and a rough cone.
11. The Virginian Pine, commonly called the Frankincence Tree.
12. The New England Pine Tree.

THERE are many other ſorts of Pines mentioned by different authors on Gardening and Botany; but theſe, from experience, and what obſervations I have been capable of making, are moſt worthy of general culture, in the climate of Great-Britain.

I ſhall begin with deſcribing the common method of cultivating the Scotch Pine or Fir, in Scotland, by which many millions are annually raiſed and planted out amongſt us; and then, with as much brevity as poſſible, lay before you ſuch hints, as I have found to be an improvement on this practice.

The uſual way is, to gather their cones in winter, and ſow the ſeed about the end of April or the beginning of May; but as at that ſeaſon of the year, the ſun has not power ſufficient to open the cones, they are obliged to lay them before a hot fire, or upon a kiln, which, if not done with great caution, and the heat made very moderate, they totally deſtroy a great part of the ſeed, or at all events, much weaken it. A little obſervation, and leſs philoſophy, will be ſufficient to ſhow this practice is oppoſite to nature, and very prejudicial to vegetation, as is the general manner of ſowing the ſeed, which is extremely thick, on beds of well-prepared earth, and covered about a quarter of an inch deep, where they are to remain two years.

Such as are not purchaſed, from the ſeed-bed, the gardeners remove to the nurſery, where they are alſo planted very thick, and from thence ſold the next or the following year, as the demand happens to be for them.

Much the greater number of Scotch Firs are planted out in Scotland, from the ſeed-bed, and ſuch are generally (though very injudiciouſly) choſen from the moſt hungry barren ſoils, and bleak expoſed ſituations, when, from the natural hardineſs of the plant, in kindly moiſt ſeaſons, they frequently grow; but, ſhould the following May, be attended with cold withering froſty winds, and June with a drought, (a circumſtance, from fatal experience, we too often find to happen in this climate,) they generally periſh.

This, however, though too frequent, is not univerſally the practice, as ſeveral gentlemen, of knowledge and experience in gardening, plant great numbers of them from the nurſery, at three and four years old, when, if they have been tolerably well cultivated, it muſt be a very bad ſoil and ſeaſon indeed, if they do not ſucceed.

Such is the common method of propagating this plant: It remains I ſhould direct its culture, in the way I have ſucceeded, with more than the common ſucceſs.

I have obſerved, that the ſeed of this tree is rarely, if ever, procured in full perfection, and that from the practice, I have juſt mentioned, of curing the ſeed. This evil is only to be prevented, by not gathering the cones before they are fully ripe, and to obtain from them the ſeed, without committing any violence on them.

The cones of the Scotch Pine, like thoſe of the Larch, advance in maturity during the whole winter, and like them, ſhould not be gathered until ſpring, though their ſubſequent management is much more ſimple, being with more eaſe diveſted of their covering.

Let the cones therefore be gathered in March or April, from the faireſt and moſt flouriſhing trees of the red kind, (ſuch as have fallen from them, are the beſt) to be kept in a dry place until June, July, or Auguſt, as the weather ſooner or later becomes warm: At the moſt favourable of theſe ſeaſons, ſpread them on a mat or canvaſs, expoſed to the ſun during the heat of the day, take them under cover in the evening, and protect them conſtantly from the rain and dews. In a few days the cones will expand, and the ſeed rattle within them: When in this ſtate, put them in a wire-ſieve, and ſhake them over a cloth, to receive the ſeed that will fall by this operation; repeat the ſpreading of the cones in the mid-day ſun for ſeveral days, as well as ſhaking them in the ſieve, until on opening ſome of the cones, you find they contain no more ſeed that are plump and freſh. Having thus procured the ſeed, let it be kept in boxes or bags, in a dry room, until the ſeaſon of ſowing.

By collecting your ſeed in this manner, you will have them unhurt, ripe and generous, a pound of which will raiſe more plants, than ſix of that uſually bought from the ſeed-gatherers: Nor is even this the greateſt advantage; for every gardener knows, (or at leaſt ought to know) that on the good quality of the ſeed, depends the future luxuriant growth of the plant, for a diſeaſed or a weak parent, is not likely to produce a healthy and vigorous offspring. It is much to be wiſhed, this circumſtance was more attended to, than it uſually is, both in the animal and vegetable creation.

I ſhall proceed to direct that management of the ſeed, from which I have found uncommon ſucceſs, in the culture of this uſeful plant; and the public may be aſſured, I ſhall not advance any thing on this ſubject, the benefit of which, I have not been fully ſenſible of, from long and frequent practice.

From ſowing the Fir ſeed ſo late in the ſeaſon, as they commonly do, they do not appear above ground, until the weather comes in warm, when the greateſt drought uſually begins in this country; from this circumſtance they muſt either be regularly watered, or whole quarters of them will periſh in a few days. Every nurſeryman of the leaſt obſervation muſt acknowledge this, as it has happened often within theſe twenty years paſt; and we need go no farther back than the year 1771, for a fatal inſtance, when not only the Scotch Firs, but all the other evergreen tree-ſeeds were burnt up, and in many ſituations even watering did not preſerve them. This is not the only misfortune that frequently attends late ſowing: There is another, and a very great one, that neither a kindly ſeaſon, nor a good ſoil, will prevent, that is, the ſmall growth of the plants;

from which, if the ſucceeding winter proves ſevere, the greateſt part of them will either be killed, or forced out of the ground.

To prevent theſe frequent misfortunes, I adviſe ſowing the ſeed about the middle of March, or as ſoon after as the land is dry, and the weather favourable, in ſhady borders of generous looſe mould, at the rate of a pound of good ſeed, to a bed of ſixty feet long, by three and a half broad. A covering of about a quarter of an inch thick, will be ſufficient for the plants to ſpring through; but ſhould they be covered at firſt to the depth of half an inch, juſt as the ſeed begins to vegetate, half of the quantity may be gently raked off, with a ſhort toothed rake, which will be a material improvement, as by it the ſurface, which otherwiſe would have been hard and battered, will be rendered looſe and mellow, remove every obſtruction, and encourage the plants to make their appearance. This circumſtance is not ſufficiently attended to, notwithſtanding its importance in the culture of plants, and ſhould not only be practiſed with all the evergreen tribe, but indeed with all tree-ſeeds in general, as it greatly increaſes their number, and accelerates both their preſent and future growth. Many thouſands of plants, in ſtiff ground, and in dry ſeaſons, are ſmothered, being unable to make their way through a hide-bound ſurface; and however general this neglect, it is too obvious to require any further explanation, as every gardener of common ſenſe, and the leaſt attention, muſt plainly perceive, that the precaution recommended, is aſſiſting nature in her operations.

I muſt likewiſe obſerve here, an almoſt univerſal error in the ſowing theſe ſeeds, which is, that if the nurſeryman has them not as thick as a bed of Creſſes, he eſteems them an inſufficient crop. This, however, is a moſt barbarous and even diſhoneſt practice, and the bad effects of it have, more than any other circumſtance I know, retarded the ſucceſs of our plantations. The plants thus raiſed, are ſtarved and dwarfiſh, and, for want of air, rendered ſo tender, as often to periſh, with the firſt hard weather; or if, from ſome favourable circumſtances in the ſoil, or ſituation of the place, they ſhould live, their ſhoots are poor and languid, their roots carroty and with bad fibres; in which ſtate they will continue for a while, until cut off by a hard winter. Many gentlemen, who have purchaſed large quantities of firs raiſed in this manner, imported from the north of Scotland, and ſold for leſs than half the price of good plants, have paid dear for their intended frugality, and are now but too ſenſible of the truth of what is here obſerved. Nor is this practice confined to the north of Scotland only; for, I am ſorry to find, it has even reached the capital of the kingdom, where ſeveral people have ſtarted up, and aſſumed the character of nurſerymen, unbred to, and unknowing in the meaneſt branches of gardening. Theſe pretenders have adopted the ſyſtem of their more northern brethren, and impoſe on the ignorant and unwary, by ſelling their ſuffocated traſh, (which they may well do,) under the rate of good plants; whence they have injured the fair-dealing intelligent nurſeryman, whoſe heart diſclaims receiving money by ſo iniquitous a practice, which would not only counteract the improvement of his country, but diſcourage the ſpirit of improvement ſo liberally carrying on, not leſs for the pleaſure of gentlemen of property, than the giving employment to the lower claſs of people. This honeſt information, it is hoped, will not be unattended to, by ſuch gentlemen, as may engage in the improvement of their eſtates, in this way.

As ſoon as the plants begin to appear above ground, ſhould the weather prove dry, and without froſt, let them be watered in the mornings early, once every four or five days, for five or ſix weeks, by which time they will have acquired ſufficient roots to continue them growing vigorouſly the remaining part of the ſummer, and require no further labour, than to keep them clear of weeds.

From the beginning or the middle of the following April, tranſplant them from the ſeed-bed (cutting away a little of their downright roots) to other ſhady well-prepared borders, plant them in rows fifteen inches aſunder, and ſix or ſeven in the row, and give them three or four plentiful waterings, and ſoon after planting, ſhould the weather require it. The ſucceeding October and March, ſpade over the ground between the rows, which will encourage the ſpreading of their fibres, here let them remain two years from their removal; at which time, theſe plants (from this culture,) will have ſuch abundance of roots, with bodies ſo thick and well-proportioned, that they will encounter all difficulties, and ſucceed in the worſt ſoils, and coldeſt ſituations, much better than ſeedlings.

For the purpoſe of giving ſpeedy ſhelter to plantations of the finer trees, by large firs, let theſe plants be again removed to another, nurſery, and planted in rows, three feet aſunder, and eighteen inches in the row, where, after ſtanding two years longer, and digging the ground as formerly, they will tranſplant with abſolute ſafety, and grow as freely, as the younger plants, notwithſtanding the general prejudice that has been conceived againſt the old Scotch Fir, which has been occaſioned, by their not being ſeaſonably tranſplanted, and otherwiſe properly cultivated.

In removing theſe plants, either from the ſeed-bed, or from one nurſery to another, I muſt adviſe that a ſimple and eaſy precaution, may never be neglected, which is, to have ſtanding by you, a tub with water and earth, mixed to ſuch a conſiſtence, as that a conſiderable quantity of it, will adhere to the roots of the plants, when immerſed in it: The moment they are raiſed, let them be plunged in the tub, as deep as they ſtood in the ground, to continue for ſeveral hours, when they will have imbibed a quantity of moiſture ſufficient, to enable them to continue in a growing ſtate, and reſiſt the drought till they have ſtruck root, when they will ſhift for themſelves. By attending to this practice, I have often ſucceeded, in the removal of Firs in unfavourable ſeaſons; but when it has been neglected, they have been generally cut off.

Though I have recommended the removal of the Scotch Fir or Pine, at a year old, yet I mean it ſhould be underſtood, under certain reſtrictions, and only practiſed, when the ſeed is early ſown on a good ſoil, as here directed, and when from a favourable ſeaſon, they have become well-grown plants; but if otherwiſe, and theſe rules have not been attended to, but on the contrary the ground poor, the ſowing late, and too thick, the plants will be ſmall, ſtunted, and unable to bear tranſplanting, ſo muſt of courſe remain another year; but even then, they will be much inferior, to thoſe of a year old, ſown ſeaſonably on good land and moderately thin. There is but one remedy that I know of, for the recovery of thick-ſown and ſtunted plants, which is, to go over the beds carefully when a year old, and thin them ſo as to leave the remainder at proper diſtances. This, perhaps, a gentleman may prevail on his gardener to do, but I fear it will be but ill reliſhed by the nurſeryman, who regards his crop more for number, than its value in goodneſs, as by the practice here recommended, a great number of ſterile plants are to be caſt away, in order to procure ſome good ones.

It has been long diſputed, whether there are more ſorts than one of the Scotch Pine or Fir, and it is generally aſſerted, that the difference we find in the wood, when cut down and poliſhed, is only owing to the age of the tree, or the quality of the ſoil, where it grew; but this aſſertion I am obliged to believe is not juſt, and proceeds from the want of ſufficient obſervation, as I have ſeen many Fir trees cut down of equal age in the ſame ſpot, where ſome were white and ſpungy, and others hard, which is concluſive to me, that there are two diſtinct ſpecies of them; and indeed the difference of colour may be eaſily diſcovered, by any one who walks through a newly-pruned plantation, even of young trees. But having dwelt ſufficiently long on the Scotch Pine, it may be neceſſary to conſider ſome of the other ſorts, and theſe the moſt beautiful kinds of the Pine tribe.

The ſecond, third, fourth, fifth, ſixth, ſeventh, and eighth ſorts, may all be propagated after the ſame manner. Thoſe have carroty deep roots, with few fibres, which makes it indiſpenſibly neceſſary, to remove them at one year old, when their roots are tender, and will more readily admit of being ſhortened, than when older, very few of them ſucceeding after their removal from the ſeed-bed above that age. This being the caſe, you muſt endeavour to render the plants as ſtrong as poſſible the firſt year. The ſeeds of theſe Pines do not riſe near ſo ſoon as thoſe of the Scotch, therefore they may with ſafety be ſown a fortnight earlier, that is, about the beginning of March. Thus ſowing them as early as the ſeaſon will permit, is the only certain way of procuring ſtrong plants. The ground then being prepared in a ſhady well-ſheltered ſituation, ſow the ſeed in ſhallow drills made with your hands, a foot aſunder, and moderately thin in the drill. This indeed will employ much more ground than ſowing them in beds, but the far better quality of the plants will outweigh that conſideration; for, as moſt of the Pines come up, with heavy tops and ſlender bodies, they are equally ſubject to be daſhed to pieces, by the winter's winds and rains, or forced out of the ground by the froſts; but by this method of ſowing, the earth can be drawn up to the plants with a ſmall hoe, from time to time, ſo as to ſecure them from the ſeverities of an ordinary ſeaſon.

The next ſpring, when the buds begin to ſwell, raiſe the plants, cut away a little from the extremity of their downright roots, and obſerve immediately to immerſe them in the water and earth ſome hours, as directed for the Scotch Pine; then plant them in a ſheltered ſhady border in drills, cut out with a ſpade, at eighteen inches aſunder, and ſeven or eight in the drill; water them at planting, and continue to do ſo moderately, as the weather may require, until you ſee them in a free growing ſtate; let them remain here two years, taking care to keep the ground clean and mellow in the ſurface, and ſpade it over between the lines in autumn and ſpring.

The four kinds laſt mentioned, are ſomewhat more tender for two or three years, but will afterwards bear very well the greateſt ſeverity of our winters: I would therefore adviſe their being ſown in pots of fine rich looſe earth, and to be protected from the ſun in ſummer, and all violent rains, but to expoſe them to the ſun during the winter and early ſpring months, under the protection of a frame without glaſſes, over which a mat may be occaſionally thrown in ſevere weather, which muſt regularly be removed on its becoming temperate.

The following ſpring, as ſoon as the buds begin to ſwell, plant them either within an old frame without glaſſes, or in a bed arched over with hoops, to admit of being covered with mats in bad weather. In theſe beds or frames, place them in lines a foot aſunder, and ſeven or eight inches in the lines: for five or ſix weeks after planting, let them be ſhaded from the mid-day ſun, until well eſtabliſhed, and in a free-growing ſtate, after which they will require no other attention than to be taken care of in ſtormy weather, and that only after the firſt year from their removal, as, in the month of May of the ſecond, the frames may be taken away during the ſummer, to be replaced in winter, but not covered, unleſs in a very ſevere ſtorm.

From theſe quarters all the Pines may be removed the ſucceeding ſpring, to where they are intended to remain, in large plantations; but for ſmaller deſigns, and for an immediate ſhow, they may be tranſplanted with ſafety, at the height of ſix or ſeven feet, and even larger, if they have been tranſplanted every ſecond year, and cultivated as here directed.

The firſt mentioned ſeven kinds are inhabitants of the mountains, and delight in a hard rocky ſoil; the next four ſorts affect a deep and moiſt ground; and the New-England Pine, the moſt beautiful of all the tribe, loves a generous, deep ſoil, but not wet, either naturally protected from violent ſtorms, or under the cover of ſome plantation, otherwiſe, as it advances in height, it loſes its ſhining verdure, and becomes ragged and unſightly; but interſperſed with other trees, in a ſoil it loves, and at a proper diſtance from them, it grows luxuriantly in this climate, and will ſoon become a noble plant. It is the moſt patient of all the Pines in tranſplanting, either young or old, as its roots tend leſs downward, but produce abundance of ſpreading fibres. I have removed them at twelve feet high with the greateſt ſucceſs, though even theſe had not been cultivated as I have directed for that purpoſe.

The uſes of the timber of the Scotch Pine are univerſally known. All the other kinds are cloſer, harder, and more laſting: But that of the New-England is much more beautiful and valuable than any of the other ſorts; it is of a darker colour, poliſhes very ſmooth, and has ſome reſemblance of Cedar.

CHAP.

CHAPTER XXVI.

THE FIR TREE.

A Deſcription of its Flower and Seed.

The male flowers are diſpoſed in a looſe bunch, having no corolla, but many ſtamina, joined in form of a column at their baſe, but ſeparate above, having erect ſummits. The female flowers are collected in an oblong cone, each ſcale including two, which have no corolla, a ſmall germin with a ſingle ſtigma; theſe are ſucceeded by membranaceous winged ſeeds.

The SPECIES *are:*

1. The Norway, or Spruce FIR TREE.
2. The black American Spruce FIR TREE.
3. The white American Spruce FIR TREE.
4. The Silver FIR TREE.
5. The Balm of Gilead FIR TREE.
6. The Hemlock Spruce FIR TREE.

THOUGH all the writers on gardening I have read, make no material diſtinction in ſowing or in the future culture of the Fir from the Pine tree, yet, from my certain experience, a very different practice ought to be obſerved, particularly, with ſome of the ſorts, and that for the moſt obvious reaſons. The Pine, the New-England only excepted, have downright roots with few fibres. Theſe roots, at tranſplanting, muſt neceſſarily be reduced, which, if done after they become hard and woody, will deſtroy the greateſt part of them. The roots of the Fir tree, on the contrary, ſpread near the ſurface, produce abundance of fibres, and do not the firſt year grow to near the ſize of the Pine in general; from hence, I think, nature plainly points out to us, the propriety of the next two years culture in the ſeminary, and even with advantage, which, to the Pine would prove deſtructive: I ſhall therefore deſcribe the practice I have found moſt ſucceſsful.

About the middle of March, ſow the firſt, ſecond, and third ſorts on beds, in a ſhady well-ſheltered border, but much thinner than the Pines, as they are to remain two years.

The three remaining ſorts do not riſe by a fortnight at leaſt, as ſoon as they do; and as they make very little progreſs the firſt year, every art and means of induſtry ſhould be uſed to promote their growth, otherwiſe many of them will be forced out of the ground, and the weaker plants entirely killed, ſhould the following winter prove ſevere. The beſt ſecurity againſt all theſe common accidents is to ſow early, therefore, let them be ſown a fortnight ſooner than the three preceding kinds, that is, by the beginning of March, provided the weather will permit. The ground intended to receive the ſeed of theſe plants, cannot be too rich in its firſt ſtate, or too finely prepared; it muſt alſo be looſe and dry, which, if not originally of that quality, muſt be rendered ſo, by mixing with it ſand, and elevating the beds ſix or ſeven inches above the alleys, the better to carry off any moiſture.

The Balm of Gilead, and Hemlock Spruce, are a little tenderer at firſt, than the other ſorts, and will be much aided in their growth, if the beds are hooped over, and covered with mats for five or ſix weeks, after the plants appear above ground, both in the middle of the day when the ſun is warm, and at night when the air is cold or froſty; and, during that time, they will require a gentle watering every ſecond evening, when rain has not fallen.

On ſowing the ſeed of the different kinds of Firs, neglect not to preſs down the beds with the back of a ſpade. This makes the ſurface ſmooth and level, prevents the ſeed from being irregularly ſcattered, on drawing on the earth with the rake, and is in ſeveral other reſpects of advantage.

As theſe plants bring up the huſk of the ſeed on their tops, the ſmall birds, who are very fond of them, will deſtroy the greateſt part, if they are not protected. The beſt method I know of, is to procure a parcel of old fiſhing nets, to ſpread over the beds, ſupported by cuttings of copſe-wood, or the prunings of trees, laid acroſs ſtakes; the nets for this purpoſe, are to be purchaſed at any ſea-port, for a mere trifle.

In the autumn after ſowing, go over your beds, and, with your fingers, carefully pick off all moſſy hard-cruſted particles, replacing them with an equal quantity of the richeſt beſt prepared ſoil; over which ſift ſome chaff, or rather ſaw-duſt that has lain ſome time, and has loſt its fiery quality. This will keep the plants warm, and prevent the ground from ſwelling with the froſt, which, if it does, is apt to caſt them up: It will likewiſe be neceſſary in hard froſt or violent rains, to throw a mat over the two laſt kinds, but to be regularly uncovered in mild weather.

In the ſucceeding ſpring, and during the months of May and June, the plants will be much invigorated by frequent waterings, and in autumn let the beds be treated as juſt directed; for though the ſeedlings are from this time until the ſpring in a ſtate of reſt, and can, from no culture, be aſſiſted in their growth until its return, yet the muſty parts contracted on the ſurface, muſt be carefully taken off, otherwiſe the winter rains will waſh them into the beds, which will contaminate them, and communicate a diſeaſe to the plants, from which they will very ſlowly recover. This circumſtance, though in general little attended to, is yet of the greateſt importance to all ſeedling trees.

In the ſpring, when the plants are two years old, and their buds begin to ſwell, let them be removed from the ſeed-bed, and treated as has been directed for the Pines of one years growth; but as all the different kinds will tranſplant, at a conſiderable ſize, with the greateſt ſucceſs, when properly managed, I ſhall add a few lines on that ſubject, as a nurſery of the fine kinds of firs, eight or ten feet high, would be a very valuable acquiſition, either to a private gentleman, or a nurſeryman; and few men of fortune, I believe, would ſcruple beſtowing a little extraordinary expence, to cover a naked field, ſhelter a new planted garden, or adorn a new-building with ſuch pleaſing ornaments.

Theſe plants, being now four years old, muſt be tranſplanted to another ſpot of good land, and placed in rows two and a half feet aſunder, and fourteen or ſixteen inches diſtant in the row; water them at planting, and continue it once a week, five or ſix times, when rain does not fall, keeping the ground clear of weeds in ſummer, and mellow by autumnal and ſpring digging, in which ſituation they may remain three years.

In the following ſpring, let them be again tranſplanted at the uſual ſeaſon, moderately ſhortening their ſtraggling roots, and plant them in rows four feet aſunder, and two feet in the row, here they are to be kept three years longer.

But if it is deſired ſtill to have them yet larger, remove them once more, and plant them at ſix feet aſunder every way, to remain two years, but not above three; as by this culture, the three firſt kinds will be from fourteen to ſixteen, and the Silver Fir from ten to twelve feet high. Theſe trees by this management, will riſe with ſuch abundance of earth ſurrounding their roots, as will prevent their receiving the leaſt injury at removing, nor will their future growth, be in the ſmalleſt degree retarded by it. Particular directions for executing this operation is unneceſſary, as the rules preſcribed for large Engliſh Elm, and other deciduous trees, will anſwer for the Pine, as well as for moſt others, in reſpect to making the pits, and preparing the ſoil: However it may be neceſſary to obſerve, that theſe, and other large Evergreens in general, require more frequent, tho' but gentle waterings, at and ſoon after tranſplanting, than the deciduous kinds;—to which I muſt add, that they are not to have a ſingle branch cut away at this time, but every operation of this ſort, muſt be executed the year before, which can be no more, than to prune their under-branches, to a foot or eighteen inches from the ſurface; in which you are further to proceed, when the trees have ſtood two years longer, when their trunks may be further cleared, by annually taking away a tire of branches, until their trunks are cleared to the intended height, which I think (in woods for timber only excepted) ought not to be more than ten or twelve feet from the ſurface, their greateſt beauty conſiſting in the graceful wave of their luxuriant branches, from the top to near the ſurface of the earth.

The three firſt mentioned Spruce Firs will grow tolerably well in dry, gravelly, or rocky ground, but much more affects that of a good depth, though very coarſe, and ſo barren as ſcarcely to produce any vegetables.

The Silver Fir, which I have ever thought the moſt magnificent tree, of all the Evergreen tribe, that our climate produces in full perfection, ſhould not be planted in an hot, dry, or rocky ſituation, as in ſuch they not only ſoon loſe their top-ſhoots, but their under branches become ragged, and, inſtead of that lively ſhining verdure peculiar to them, in a ſoil they like, they become of a pale languid hue; nay I have known trees above twenty years planted in ſuch ſoils, entirely deſtroyed by one hot dry ſummer, notwithſtanding they in other reſpects, were the leaſt delicate of any other plant, in the choice of their food; the largeſt and moſt flouriſhing of them, I have ever found growing in this iſland, are generally on a ſour, heavy, obſtinate clay, compounded of different qualities and colours; where, perhaps, for the firſt ten or twelve years, they will not advance ſo faſt as ſeveral of the other tribes; yet in twenty, they will outgrow them, and continue that advantage, until they arrive to their greateſt magnitude.

Theſe trees, like others of the common ſorts, intended for timber, ſhould not be planted together in thickets, as they require a free circulation of air, and in that ſituation their intermingled branches would deſtroy each other.

The Balm of Gilead Fir, notwithſtanding it is deſcribed as growing to a large ſize in America, and ranked in our catalogues amongſt the talleſt trees, yet in this climate they never come to any great magnitude. It requires a generous deep-feeding ſoil, and ſheltered ſituation, to which, from its ſingular beauty and elegance, it is juſtly intitled, and merits our greateſt attention and care.

The Hemlock Spruce Fir is a pretty plant, but delicate, and, to ſucceed well with us, muſt be indulged with a good ſoil, and warm ſituation: It will likewiſe be improved, by tying its leading ſhoot to a ſtake as it advances.

Though I have directed the ſpring, as the moſt proper ſeaſon for planting Firs and Pines, which, it certainly is for ſeedlings, and the tender ſorts, —yet I muſt beg the reader's further indulgence, to recommend what will be found, if generally attended to, the greateſt improvement ever yet practiſed, on moſt of the Evergreen ſpecies. The experiment is both cheap and eaſy, and only wants to be put into execution, to recommend its ſelf to every planter in Great Britain; which is no more than this, that inſtead of planting the hardy kinds at a foot or more in height, as ſoon as they have perfected their ſhoots in ſpring, to plant them in Auguſt. For a ſucceſſion of years, I have planted many thouſands at that ſeaſon, without being once diſappointed in my moſt ſanguine expectations; but before this became my practice, I had great loſſes in unkindly ſprings, and dry ſummers, though all poſſible care had been taken: In this I cannot ſuppoſe myſelf ſingular, and I dare ſay, it has been experienced by every extenſive planter, whoſe ſituation has been ſimilar to mine. Though experience is the only unerring guide in the purſuits of nature, yet there appears many natural reaſons to give the preference to this ſeaſon: The ſhoots of the plants are now ripened,——the ground ſtill warm, and pregnant with vegetation, — and by working the earth, that vegetation is as it were artificially put in a freſh and more vigorous motion,—and rain at this ſeaſon is ſeldom or ever wanted;——all which conſpire, to mark it highly favourable for new plantations. From this happy temperature of the earth at this ſeaſon, the trees ſtrike root immediately, not having any thing to oppoſe them until the approach of froſt, by which time they will be ſufficiently eſtabliſhed, and ſtrengthened to reſiſt its power. To all theſe advantages, may be added that ſaving of time and labour, which a ſpring operation would require, of watering, and particularly in the ſummer months, which the choice of the ſeaſon here recommended precludes. And to this may be added, the opportunity given to attend the plantations, from the leſſer number of operations, and diverſity of works, neceſſary in the autumnal, than the ſpring ſeaſon.

Give me leave, before I conclude this intereſting chapter, to obſerve, that I have been often ſurpriſed to find that the Scotch Pine or Fir, ſhould be the only Evergreen uſed to any great extent, for every ſoil and ſituation, though incapable of becoming the moſt deſirable of Foreſt-trees of this tribe. In mountainy, and rocky ſituations, and in chalky, ſandy and gravelly ſoils, not any better can be uſed; but in hungry deep till, and clay, the Spruce Fir will much ſurpaſs it, and is a tree of much greater beauty, of more valuable timber, and propagated with the ſame facility. We are very negligent of our intereſts, in not planting them where the ſoil invites, and more particularly, as they would contribute both to our pleaſure and profit, in an extenſive way, and in ſituations that now appear a cold and gloomy tract of inhoſpitable land. For ſhelter to gardens or other plantations, in cold ſituations, I know no plant ſo proper, as the Norway Spruce Fir: They make ſtrong fences, and grow amazingly faſt, ſheep or cattle do not annoy them; in ſpring as ſoon as they begin to ſhoot, and the weather is moiſt, they are to be clipped thin in their tops, to come down gradually thicker, as they approach to the bottom, when they will continue many years beautiful and in full verdure, as by this form no part will be over-ſhadowed, but all equally enjoy the influence of the ſun and air.

The different kinds of Firs are injured by lopping off their wood when old, therefore, they ought to be pruned when their branches are young and tender. The beſt ſeaſon for pruning them, is, as ſoon in autumn as the ſap is at reſt.

Of SCOTCH PINES; *by James Farquharſon, Eſq*; *of Inv:rcauld. From the Appendix to Mr. Pennant's late Tour in Scotland*; *introduced by the Publiſher of this Edition.*

IT is generally believed that there are two kinds of Fir trees, the produce of Scotland, viz. the red or reſinous, a large tree of a fine grain, and hard ſolid wood: the other, a white wooded Fir with a much ſmaller proportion of reſin, of a coarſer grain, and a ſoft ſpungy nature, which never comes to ſo great a ſize, and much more liable to decay. At firſt appearance, this would readily denote two diſtinct ſpecies, but I am convinced that all the trees in Scotland, under the denomination of Scotch Fir, are the ſame; and that the difference of the quality of the wood, and ſize of the trees, is entirely owing to circumſtances, ſuch as the climate, ſituation, and ſoil they grow in. The fineſt Fir trees, appear in the moſt mountainous parts of the Highlands of Scotland, in glens, or on the ſides of hills generally lying to a northerly aſpect, and the ſoil of a hard gravelly conſiſtence, being the natural produce of theſe places; the winged ſeeds are ſcattered in quantities by the winds, from the cones of the adjacent trees, which expand in April and May, with the heat of the ſun; theſe ſeedlings, when young, riſe extremely cloſe together; this makes them grow ſtraight, and free from ſide branches of any ſize, to the height of fifty or ſixty feet, before they acquire the diameter of a foot: even in this progreſs to height, they are very ſlow, occaſioned by the poorneſs of the ſoil, and the numbers on a ſmall ſurface, which I may ſay makes them in a conſtant ſtate of war for their ſcanty nouriſhment, the ſtronger and talleſt by degrees over-topping the weaker, and when the winds blow they laſh againſt them; this aſſiſts in beating off any horizontal branches that might damage the timber with knots, as well as by degrees cruſhes the over-topped trees. In ſuch ſtate of hoſtility they continue ſtruggling, until the maſter trees acquire ſome ſpace around them; then they begin to ſhoot out in a more buſhy manner at the top, gradually loſing their ſpiral form, increaſing afterwards more in ſize of body than height, ſome acquiring four feet diameter, and above ſixty feet of height to the branches, and fitting for the fineſt deal board. The growth is extremely ſlow, as is evident from the ſmallneſs of the grain of the wood, which appears diſtinctly in circles, from the centre to the bark. Upon cutting a tree very cloſe at the root, I could venture to point out the exact age, which in theſe old Firs comes to an amazing number of years. I lately pitched upon one of two feet and a half diameter, which is nearly the ſize of a planted Fir, of fifty years growth, and I counted exactly two hundred and fourteen circles or coats, which makes this natural Fir above four times the age of thoſe planted. Now as to planted Firs, theſe are raiſed firſt in dreſſed ground from the ſeed, where they ſtand two ſeaſons or more, then are planted out in the ground they are to continue in, at regular diſtances, have a clear circumference round them, for extending both roots and branches; the one gives too quick nouriſhment to the tree, which ſhoots out in luxuriant growth, and the other allows many of the branches to ſpread horizontally,

tally, ſpoiling the timber with knots; beſides, this quick growth greatly encreaſes theſe yearly circular coats of wood, but forms them of a coarſe grain, and ſpungy nature. Their juices and their reſinous balm, never ſufficiently ripen by this quick vegetation, ſo that the plantation decays before the wood acquires age, or a valuable ſize, and the timber when uſed in work has neither ſtrength, beauty, nor duration. I believe the climate has likewiſe a great ſhare in forming the nature of the beſt woods, which I account for in the following manner. The moſt mountainous parts of the Highlands, particularly the northerly hanging ſituations, where theſe fine Fir-trees have a much ſhorter time for vegetation, than a more ſoutherly expoſure; or the lower open countries, which are ſhaded by high hills from the rays of the ſun even at mid-day, for months together, ſo that vegetation continues longer in a torpid ſtate here, than in other places of the ſame latitude. This dead ſtate of nature for ſuch a length of time yearly, appears to me neceſſary to form the ſtrength and health of this particular ſpecies of timber. No doubt they may at firſt ſhow a gratefulneſs for better ſoil and more ſun, by ſhooting out ſpontaneouſly, but if the tree is ſo altered by this luxury, that it cannot attain any degree of perfection fit for the purpoſes intended, the attempt certainly proves vain.

What has been juſt obſerved, is not intended to diſſuade gentlemen from planting the Scotch Fir, but to encourage ſuch as are poſſeſſed of the ſoil and ſituation above deſcribed, to make a proper uſe of them, whom I would not adviſe to plant in lines, but irregularly, and thicker than common, when the trees will come to be of equal ſize and value, with thoſe planted by nature. In confidence of this, I have planted ſeveral millions on the ſides of hills, out of the reach of ſeed from the natural Firs.

CHAPTER XXVII.

THE CEDAR TREE.

A Deſcription of its Flower and Seed.

N°. 1. *It hath male and female flowers growing ſeparate on the ſame tree. The male flowers are diſpoſed in a ſcaly catkin; theſe have no petals, but a great number of ſtamina, which are connected in a column below, but are ſeparated at their points, and are terminated by erect ſummits. The female flowers are diſpoſed in a conical ſhape, having no petals; theſe are placed by pairs under each ſcale, having a ſmall germin, ſupporting an awl-ſhaped ſtyle, crowned by a ſingle ſtigma. The germin afterward becomes a nut with a membraneous wing, incloſed in the ſcale of the cones.*

N°. 3 and 4. *It hath male and female flowers in different plants, and ſometimes at ſeparate diſtances on the ſame plant. The male flowers grow on a conical catkin; the flowers are placed by threes, two of them faſtened along the common tail oppoſite, terminated by a ſingle one; the ſcales are broad, ſhort, lying over each other, and fixed to the column by a very ſhort footſtalk. The flower has not any petal, but three ſtamina in the male flower, which are joined in one body below, having three diſtinct ſummits, adhering to the ſcales of the lateral flowers. The female flowers have a ſmall three-pointed empalement ſitting upon the germin, which is permanent; they have three ſtiff, acute, permanent petals; the germin ſitting below the empalement, ſupports three ſingle ſtyles, crowned by ſtigmas. The germin afterward becomes a roundiſh berry*

berry, incloſing three ſtoney ſeeds, which are oblong and angular on one ſide, but convex on the other.

The SPECIES *are:*

1. The CEDAR of Libanus.
2. The red Virginian CEDAR.
3. The white-berried Virginian CEDAR.
4. The CEDAR of Bermudas.
5. The TREE, or Swediſh Juniper.

THE cones of the Cedar of Libanus were formerly brought to Britain from the Levant; but the Engliſh trees have ſince produced abundance, and of a better quality than the foreign. The late Mr. Philip Miller, (whoſe memory I ſhall ever revere, as my worthy friend, and moſt indulgent communicative maſter), from his naturally acute and ingenious obſervations, as well as having four of the fineſt plants in England under his direction, (now growing in the Phyſic-garden of Chelſea,) had an opportunity of knowing the nature of this tree, better than moſt men amongſt us;—He hath obſerved, that they produce more and better ripened cones in hard winters, than in mild; and that the Engliſh trees produce more and better ſeeds than the foreign, of which I have certain demonſtration, having, from his bounty, annually received, a preſent of a conſiderable number of his cones, for above twenty years, which never failed, while thoſe purchaſed at a conſiderable expence from abroad, often did.

Theſe noble and magnificent trees at Chelſea, were for ſeveral years under my almoſt daily inſpection, ſo that I could not but have a reſpectable veneration for this plant; of which, I have raiſed more than any other man ever did in Scotland, as well as being the firſt who made them known in this part of the kingdom; in both of which I was aſſiſted by Mr. Miller, (whoſe friendſhip, I have already acknowledged,) which alſo enabled me to make ſuch different experiments on their culture, as properly to direct it; of which they will not have the leaſt occaſion, when arrived to their third or fourth years growth.

The way that was firſt practiſed for procuring their ſeed, was by ſplitting the cones length-ways thro' the centre, with a ſharp piece of iron, and to pick them out with your fingers, which may be eaſily done, after the cones have been expoſed ſome hours before a warm fire. Should the cones be two years old, they will emit their ſeed more freely than when juſt gathered, and the ſeed equally good.

The beſt ſoil to raiſe theſe plants in, is that of a rich old cow-paſture, which, if not naturally of a light quality, muſt be mixed with a fourth or fifth part of ſea-ſand, or that taken from the ſides of rivulets, to be well blended together for ſome months, before it is uſed. I have already mentioned that this tree, will not require any attention after it has arrived to the age of three or four years, nor is it very delicate from the beginning; yet at the ſame time, it is abſolutely neceſſary to give them abundant nouriſhment at firſt, in order to raiſe a fair and vigorous plant; for if they once become dwarfiſh, ſtunted, or to loſe their leading ſhoot, no art will be poſſible ever afterwards to reſtore them to a good figure: Therefore, to raiſe a number of plants, is not a thing ſo deſirable, as to raiſe them healthful and of a comely figure, and which cannot be done without having both ſkill and attention. Therefore, in order to effect both, obſerve the following directions:

Having prepared your ſoil as juſt directed, which muſt be in a ſheltered ſituation, expoſed only to the morning ſun, place on it an old hotbed frame, and lay in it to the depth of ſeven or eight inches of this compoſt, in which ſow the ſeeds the beginning of March, which muſt be in ſhallow drills made with your finger, a foot or fourteen inches aſunder. About a fortnight after ſowing, ſhould the weather prove dry, give them a very gentle ſprinkling of water every ſecond evening while it continues. In about ſix weeks the plants will appear above ground, when, if the nights are froſty, which they often are at this ſeaſon, let a mat be thrown over them in the evening, and taken off next morning or in the forenoon, ſhould the rays of the ſun have diſpelled the froſt. As ſoon as the weather becomes mild, but continuing dry, the waterings muſt be regularly continued, though in a leſs plentiful degree; which will be much ſafer to do in the mornings while the froſt laſts, when, as ſoon as it is gone, they will benefit more by the evening waterings.

The Cedar comes up, and continues for the firſt year, to ſhow remarkable tall and thin bodies, with heavy tops, inclining downwards: They have downright roots, with very few fibres; and penetrate ſo little into the earth, that I have ſeen great numbers of them laid flat, and beaten entirely out of the ground by the rain, and even in the ſummer months. To remedy this evil, no method is equal to occaſionally drawing up the mould about their ſtems, as they advance, which will not only preſerve, but much invigorate their growth. This being attended to, they will require no further care until next ſeaſon, but to cover the frame with a mat in violent rains or ſevere froſts, never omitting to uncover them in mild weather.

The following ſpring, prepare another ſpot in the ſame manner as you did for the ſeed, but let the compoſt ſoil be twelve or fourteen inches deep, then with a very ſharp knife, cut off the points of their downright roots, which are very tender, and would otherwiſe have their fibres tore; immerſe them about half an hour in ſuch pap as has been directed for the Pines and Firs, and plant them in beds of eighteen inches by a foot aſunder. Theſe beds muſt be hooped over, and a mat thrown over them during the heat of the day, which will much accelerate their taking root, and to expand their leaves; the ſame care muſt be taken of them during the winter ſtorms. It will be likewiſe neceſſary, the firſt ſummer, to draw a little earth to their ſtems, as directed for the ſeedlings, giving them frequent and gentle waterings during the growing ſeaſon. By next ſpring the Cedars will be out of danger, the hoops and mats will be of no further uſe, the plants now requiring no other than common culture.

The plants being now three years old, will be ſufficiently hardy for removing to a common nurſery;

ſery; in any ordinary ſoil or ſituation, where they ſhould be planted about the beginning of April, in lines two and a half feet aſunder, and fourteen or ſixteen inches diſtant in the line. At tranſplanting, continue to reduce the downright roots, and moderately ſhorten the ſmaller fibres, which will occaſion their producing many more new roots, ſo as afterwards to riſe with balls of earth cloſely adhering to them;—it will however be neceſſary to ſteep them in the pap as juſt directed, and to water them at planting, which is to be continued every fourth or fifth evening for ſix weeks, the weather being dry. Here let them continue two years, when they may be removed to the places where they are intended to remain; but ſhould they be deſired larger for future deſigns, they may be again tranſplanted to another quarter, and placed in rows five feet aſunder, and three feet in the row, to continue three years longer; when they will ſucceed equally well with the youngeſt plant, by ſeaſonable and repeated waterings.

This culture which I have juſt directed is beſt for ſuch gentlemen, as have only occaſion to remove the plants from their nurſery to the adjoining fields; but for the nurſeryman, who often ſend them to a great diſtance, I would adviſe the plants to be put in pots of nine inches diameter, when three years old, where, to be kept for three years longer, when they may be taken out with their balls of earth entire, to be wrapped up in a piece of mat, and ſent with the greateſt ſafety to the remoteſt corners of the iſland, and will keep ſeveral months out of the ground without ſuffering any injury.

As ſoon as the plants begin to grow freely, the leading ſhoot always inclines to one ſide: To remedy this, you muſt fix a ſtake by the ſide of each plant, and tie the leader cloſe to it, until it has got to a conſiderable height, otherwiſe their branches will greatly expand, and prevent their growing tall.

To whatever height you intend clearing their trunks, (which ought never to be great, as much of their beauty conſiſts in being cloathed with their noble verdant boughs to near the ſurface), let the branches be cut off when young and tender, as no tree I know of, reſents more the lopping them off when old. Mr. Miller, in his Dictionary mentions, that two of the four trees he raiſed, having their branches trimmed, in order to admit the rays of the ſun into the green-houſe, were ſo much checked by it, as, in above forty years growth, to be little more than half the ſize of the other two: A ſimilar circumſtance I have alſo experienced, for, having planted two Cedars about twenty-four years ſince, then three feet high, which grew amazingly faſt for ſixteen years, and promiſed to be noble plants, until an ignorant fellow cut off ſeveral of their oldeſt under-branches, ſince which they have advanced little or nothing in height, have loſt their leading ſhoots, and become ragged and buſhy.

Though theſe plants while young, require all the culture and ſhelter here directed, to make them handſome and vigorous trees, yet, when five or ſix years old, no plant will better endure our moſt ſevere ſeaſons, or grow in a more forbidding, poor, and hungry ſoil; the largeſt trees of them known in the world, being in the coldeſt and moſt expoſed ſituations, covered with ſnow great part of the year; from hence, it cannot be doubted, but that they might become a great ornament, and valuable improvement, if more generally planted in Great-Britain.

The Antients had a great reſpect for the wood of this tree, of which they have given many legendary tales, it was much uſed in many of the glorious ſtructures raiſed by them, which laſted to very diſtant ages.

The red and white Virginian Cedars are eaſily propagated, by ſowing their berries in ſpring, on beds of a good mellow light ſoil, expoſed only to the morning ſun, and ſheltered by trees, hedges, or walls. The ſeed will remain a year in the ground before it appears; during which time, the beds muſt be kept clean, and their ſurfaces looſe: It will likewiſe be neceſſary, in extreme drought, to give them now and then a gentle ſprinkling of water, which will keep the berries in vigour, for I have known many of them periſh for want of this attention, and the remainder to come up weak, late, and irregular, after a very dry ſummer. As the plants make but a ſmall progreſs the firſt year, they may remain two years in the ſeed-bed; when in the ſummer ſeaſon, they muſt be frequently refreſhed with water, and the ſurface of the beds dreſſed in autumn, as has been directed for other ſeedlings.

The following ſpring, remove them to another well-ſheltered ſpot, of the ſame quality of the ſeed-bed, and plant them in lines, eighteen inches aſunder, and nine or ten diſtant in the line; give them the ſame culture as directed for Evergreens of that age, and to remain for two years.

From

From hence remove them to another quarter of the nurſery, in any ordinary ſoil and ſituation, cutting away the extreme parts of their roots, with ſuch branches, as are crowded or ill-placed, and plant them in lines, three and a half feet aſunder, and two feet in the line; let them be watered at planting, and frequently in dry weather, until paſt mid-ſummer, keeping the ground entirely clean; and here they ought to remain three years, when they will be of a proper ſize, to be planted out for good.

I would likewiſe adviſe nurſerymen, to pot ſome of theſe plants, in the ſame manner as directed for the Cedar of Libanus, for the better conveying them to diſtances; they are a very fit tree to plant with myrtles, annual flowers, and other potted plants, to adorn the borders of the flower-garden or court-yard.

The Swediſh Juniper, may be treated in all reſpects like the red and white Cedar.

The Bermudas Cedar when young, is more delicate and ſlower in growth, than the ſorts mentioned; it will therefore be an improvement to ſow their berries in pots, to keep them in the ſhade during the ſummer months, and under a frame the following winter. In the ſpring, when the ſeeds begin to vegetate, plunge the pots into a moderate hot-bed until the month of July, from whence they will advance more in one ſeaſon, than two in their natural ſtate, and make better plants.

The ſucceeding ſpring, plant each of them in halfpenny pots, and again plunge them in a hot-bed till July, when, in mild weather, they may by degrees be inured to the open air, and the following ſpring put into penny pots, where they ſhould remain two years, when they ought once more, either to be ſhifted into two-penny pots, or planted in a well ſheltered place in the nurſery for three years, by which time they will reſiſt our ſevereſt winters. Though this proceſs may appear troubleſome, it is only ſo in a very trifling degree to a gardener, who has proper convenience for executing his buſineſs. The Bermudas Cedar, being a plant of great beauty and elegance, is well worth a little extraordinary pains, to bring it ſoon to perfection.

The two Virginian kinds, and Swediſh Juniper, will grow from cuttings, from which I have raiſed many handſome plants: This may be done the beginning of April, but the latter end of Auguſt I have found the moſt promiſing ſeaſon. Being then provided with branches of one or two years growth, cut or tear them aſunder at the joints, leaving to them a knob of the old wood, and clear off the leaves or ſmall twigs, as far as the cuttings are to be planted in the ground, which, ſhould be to about ſix inches; plant them in lines eighteen inches diſtant, in a ſhady border of rich looſe earth, and refreſh them with water as the ſeaſon may require. The following ſummer, let the ground between the lines be kept looſe and mellow, by frequent ſtirring it with a trowel; water them every third or fourth evening in dry weather, and the ſecond ſpring they will be ſufficiently rooted, to tranſplant to the quarters of the nurſery, there to be treated as the ſeedlings.

The Bermudas Cedar will likewiſe grow by cuttings, tho' not ſo freely in the open ground; but let ten or twelve of them be put in a penny pot, and plunged into a hot-bed of tanners bark, they will root freely in one ſummer; and if taken out of thoſe pots the ſucceeding ſpring, and put into others of the ſame ſize, and again plunged in the hot-bed for another ſummer, they will be larger plants than the ſeedlings at four years old, and may afterwards be treated as has been directed for them.

I have often heard gardeners boaſt that they have raiſed abundance of good plants from cuttings of the Cedar of Libanus. This knowledge I have been unlucky enough not yet to arrive at. I have tried every method for this purpoſe I could deviſe, but never could procure or did I ever ſee a healthful well ſhapely plant raiſed in that way: I can make them live, but in plants as well as animals, ſomething more than bare exiſtence, is ſurely wanted.

There are various other ſorts of Cedars, but the rules here laid down for the culture of thoſe mentioned, are ſufficient for the whole tribe, only obſerving, that your ſeeds or plants that are brought from warm and temperate regions, require more aid and protection for ſome time, than thoſe from the more inhoſpitable.

In the culture of the different ſpecies of the Cedar, as well as the Libanus, let it be an invariable rule, to prune and reduce them to their proper form, while their branches are young, when their wounds will immediately heal; but ſhould this be neglected until they are old and woody, ſo great an effuſion of ſap will flow in the hot weather, as will render the trees weak and unhealthy, if not entirely deſtroy them.

There are perhaps no ſpecies of trees that ſucceed ſo well in ſo great a variety of ſoils, or in more oppoſite climates, than the Cedar does: It grows in all extremes, in the moiſt Barbadoes, the hot Bermudas, and the cold New-England; they thrive in the bogs of America, and the mountains of Aſia. We have now many goodly thriving trees of them in Britain, and, from the almoſt incredible value of the wood, joined to the extraordinary beauty of the plant, we have every encouragement, to make more extenſive and general plantations of them.

CHAPTER XXVIII.

THE CYPRESS TREE.

A Deſcription of its Flower and Seed.

It hath male and female flowers growing at diſtances on the ſame plant; the male flowers are formed into oval catkins, in which the flowers are placed thinly, among ſeveral roundiſh ſcales, each having a ſingle flower. Theſe have no petals nor ſtamina, but have four ſummits which adhere to the bottom of the ſcales. The female flowers are formed in a roundiſh cone, each containing eight or ten flowers; the ſcales of the cones are oppoſite, each having a ſingle flower, theſe have no petals; the germin is ſcarce viſible, but under each ſcale there are many punctures or ſpots, and a concave turncated apex inſtead of a ſtyle; this afterward becomes a globular cone, opening in angular target-ſhaped ſcales, under which are ſituated angular ſeeds.

The SPECIES *are:*

1. The common upright CYPRESS TREE.
2. The male ſpreading CYPRESS TREE.
3. The Virginian or deciduous CYPRESS TREE.
4. The American CYPRESS TREE, commonly called the WHITE CEDAR.

THE firſt, ſecond, and third ſorts, are propagated by ſowing their ſeed about the middle of March, in ſheltered ſhady borders of fine rich looſe earth, which in five or ſix weeks will appear above ground, when they muſt be regularly watered in the evenings of mild dry weather, every third or fourth night, and this continued, giving them but little at a time, until the middle of Auguſt; and if in the beginning of winter ſome ſawduſt is ſifted over them, as directed for the Firs, it will much contribute to their preſervation in ſevere weather.

The following ſpring, theſe plants when carefully attended to, will be ſix or ſeven inches high, when they muſt be moved to the ſame kind of ſoil and ſituation they were in the ſeminary, their downright roots ſhortened, and planted in lines eighteen inches aſunder, and eight or nine inches in the line, as their roots naturally incline more to run deep, than ſpread beneath the ſurface, and as they are plants of a free growth, they are to remain no more than one year, when they ſhould be upwards of a foot high.

Therefore, the ſucceeding ſpring, plant them in the common nurſery, in lines three feet aſunder, and eighteen inches in the line; water them at planting, and repeat it once every week, the weather being dry, until they have ſtruck root and begin to grow freely, when they will require no further attention, than to keep them clean, and pointing over the ground between the lines in autumn and ſpring.

Having ſtood in this nurſery two years, they may be removed to the places where they are deſigned to ſtand, which may be more properly done at this age than when older. Theſe trees loſe the greateſt part of their beauty when much pruned; but their tops being very heavy, and branches flexible, the winds make ſo much impreſſion on them, that I have known numbers of them blown out of the ground, that were moved when about ſix feet high, and had ſtood for two years: Wherefore it is beſt to give them a firm eſtabliſhment in the earth, while the plants are young, when there will not be the ſame neceſſity to take away ſo many of their branches, as they would otherwiſe require.

The directions juſt given, is the eaſieſt and quickeſt way of raiſing great numbers of them; but as it is no uncommon thing, for a hard winter to deſtroy whole beds, whether of one, and even two years growth, it becomes neceſſary to provide againſt ſuch misfortunes, by ſowing part of your ſeed in pots.

For this purpoſe, being provided with the rich looſe earth, directed for the ſeed when ſown in borders, about the middle of March ſet your ſeed in pots, to be covered to the depth of a quarter of an inch; place them in a ſheltered ſituation, ſo as to receive the morning ſun, until ten or eleven o'clock; keep them regularly but moderately watered, and in October, remove the pots under a frame, ſo as they may be protected in ſevere weather.

The ſucceeding ſpring, ſhake them out of theſe pots, and plant them in others of fourteen or ſixteen inches diameter, each of which will contain from ſixteen to twenty plants: Let them be placed in the ſhade until in a free growing ſtate, and in winter removed under a frame, and to be afterwards treated as directed for the others of the ſame age.

The American Cypreſs is ſomewhat more tender and ſlower of growth, than the ſorts already mentioned, and they continue a year in the ground before they appear; I would therefore adviſe all theſe to be ſown in pots, and treated the firſt ſeaſon as the other ſorts: But the ſucceeding ſpring, when the ſeed begins to vegetate, let the ſurface be cleared of all mouldy particles, and replaced by ſome freſh earth, ſifted on in proportion to that taken off; the pots is then to be plunged into a moderate hot-bed until June, and afterwards to be gradually inured to the open air, placing them ſo as to be protected during the ſeverity of the winter.

The following ſpring, ſet ſixteen or twenty of the plants in other pots, in the ſame manner as you treated the former; obſerving they are to be again plunged in an hot-bed, to remain for about two months, and to be protected as before during the winter. In theſe pots they may be kept another year, without any more trouble than keeping them clean, and refreſhing them with frequent waterings; after this, they may be moved to the nurſery, and planted in lines three feet aſunder, and eighteen inches in the line, where they are to remain for three years, and then to be tranſplanted to the places where they are intended to be placed for good.

Theſe trees require a particular attention in pruning them; for if they are trimmed cloſe, to any conſiderable height, their bodies will be ſo ſlender, as not to bear any proportion to their weighty tops: The beſt method therefore of ordering them, for the purpoſe of preſerving their beauty, and to accelerate their growth, is, to cut away from the top to near the bottom, all ill-placed forked branches, (of which this plant produces many), reſerving only, at proper diſtances, ſuch as are vigorous, and radiate directly from the body. This is an eaſy operation, and will require very little repetition, the tree not being diſpoſed to put out young branches from the old ſtem. By pruning them judiciouſly in this manner, their thick branchy trunks will counterpoiſe their heavy heads, and render them able to reſiſt the winds.

The firſt and ſecond ſorts affect a dry, ſandy, or gravelly ſoil; the third, in Virginia, is generally found in moiſt ſwampy places, and ſometimes in conſtant ſtanding water; but the American ſort, I have always found ſucceed beſt in a good deep-feeding earth, neither too wet nor too dry.

The Cypreſs has not only a fine effect when mixed with (though not crowded near) other trees, but is of any plants the moſt proper to place round or near buildings, where their upright pyramidal growth has a very pictureſque appearance, without obſtructing the view, and their dark-green leaves makes a moſt agreeable contraſt, with the colour of the building. The Italian villas owe no ſmall part of their beauty to the proper diſpoſition of their Cypreſs trees, near their temples, and other ornamental works of architecture, which they have in their gardens.

Like that of the Cedar, many are the virtues and excellencies attributed to this tree, both by the ancient and modern writers. It is recommended for the improvement of the air, and a ſpecific for the lungs, as ſending forth great quantities of aromatic and balſamic emiſſions; for which reaſon, the antient phyſicians of the Eaſtern countries uſed to ſend their patients troubled with weak lungs to the iſland of Candia, at that time abounding with theſe trees, where, from their effects or the air alone, few failed to perfect a cure. The doors of St. Peter's church at Rome, were made of Cypreſs, which laſted from the times of Conſtantine the Great to Pope Eugenius the IVth, being eleven hundred years, and were then changed for gates of braſs, and found entirely ſound.

CHAPTER XXIX.

THE *ARBOR VITÆ*, OR, TREE OF LIFE.

A Deſcription of its Flower and Seed.

It hath male and female flowers in the ſame plant; the male flowers are produced in an oval catkin. The flowers are placed oppoſite upon the common foot-ſtalk, each flower embracing it with its baſe; theſe come out of an oval concave ſcale; they have no petals, but have four ſtamina which are ſcarce diſcernible; their ſummits adhere to the baſe of the ſcale of the empalements. The female flowers are collected in a common almoſt oval cone, two flowers ſtanding oppoſite in each ſcale; they have no petals, but have ſmall germin, ſupporting a ſlender ſtyle, crowned by a ſingle ſtigma; theſe are ſucceeded by an oblong oval cone, opening longitudinally, whoſe ſcales are almoſt equal, convex on the outſide, and obtuſe, each containing an oblong ſeed, with a membranaceous wing.

The SPECIES *are:*

1. The common ARBOR VITÆ.
2. The Chineſe ARBOR VITÆ.
3. The ARBOR VITÆ, with ſtriped leaves.

THE firſt of theſe may be propagated either by ſeed, layers, or cuttings; but as the ſeed lies a year in the ground before it appears, renders this manner of culture tedious, and the layers and cuttings making very good plants, the propagating them by ſeed is not generally followed.

When you increaſe them by layers, let that operation be performed in the month of March, watering them during the ſpring and ſummer months, more or leſs as the weather requires, which will much aſſiſt their rooting, when by the following ſpring they will be fit to be taken off.

If they are to be raiſed from cuttings, the culture directed for the red and white Virginian Cedars will beſt agree with them, which muſt be conſulted.

The plants having got ſufficient roots, tranſplant them to a border ſcreened from the mid-day ſun, in lines two and a half feet aſunder, and one foot in the line; water them at planting, and continue to do ſo once in five or ſix days, ſhould the weather prove dry, during the ſpring and ſummer months; keep the ground clean and looſe about them, and point it over in autumn and ſpring; in which ſituation let them remain two years.

From hence remove them to any ordinary quarter of the nurſery; cutting away but a little of the extremities of their roots, with ſuch as are ill-placed and croſs each other; plant them in lines three and a half feet aſunder, and two feet diſtant in the line, ordering them as in their former quarters, and let them continue here three years, when they will be of a proper ſize to tranſplant where they are to ſtand for good. But if large plants are wanted, to make an immediate appearance in ſingle trees, in groves, or in the wilderneſs,

derneſs, they muſt be again removed to another nurſery, and planted about five feet aſunder every way, to ſtand two, three, or four years longer; this tree is as patient on removal (when large) as any Evergreen; this I ſpeak from experience, having tranſplanted them at ten and twelve feet high, with all the ſucceſs that could be deſired.

The Chineſe *Arbor Vitæ*, though it becomes a hardy plant, is, when young, a little more delicate and ſlower of growth than the other, neither does it root well by layers in leſs than two years, or take freely by cuttings in the open ground; therefore it may be adviſeable to raiſe them from ſeed, when the culture directed for the American Cypreſs, will in all reſpects anſwer well.

It may likewiſe be proper to raiſe part of them by layers, which will be rooted in two years. In the beginning of April, let them be planted in penny-pots, and then, to forward their growth, plunge them into a moderate hot-bed of tanners bark, until the beginning of Auguſt; after this, inure them by degrees to the open air, and place them under ſome protection during the ſucceeding winter. In the following ſpring, take as much earth out of the pots as can be done without injuring the roots, replacing it with rich freſh mould; and in theſe pots let them remain a ſecond year, watering them in dry weather every third or fourth day, when they may be taken out with balls of earth cloſely adhering to them, and afterwards treated in reſpect of ſoil, as the common kind; but, to preſerve their beautiful verdure unſullied in a ſevere winter, I would adviſe them to be planted (thought not near), yet under the protection of other trees.

This tree may alſo be propagated by cuttings, ſetting ten or twelve in a penny-pot, plunging them into the bark-bed, as directed for layers, and giving them the ſame management.

The ſort with ſtriped leaves, may be increaſed by layers or cuttings as the common kind, but muſt be planted on a thin dry land, to preſerve their variegation ſtrong.

For the pruning of theſe trees, I can preſcribe no better method than has been already directed for the Cypreſs, to which they have a near reſemblance, and with which they will perfectly agree.

The common kind will grow in very indifferent ground, but moſtly affect a deep ſound earth, where they will ſoon make great progreſs; and though in winter their leaves are of a dull hue, yet, in ſpring and in the ſummer months, they are of a very chearful green, and the plants have a moſt agreeable negligent appearance.

The great value of the wood for bowls, boxes, cups, mortars, peſtles, and various works for the turner and cabinet-maker, are generally known, and being a tree that bears our ſevereſt winters, and ſoon arrives to a middling ſtature, it juſtly claims our attention, and would become an improvement in our extenſive plantations.

The Chineſe ſort, from the obſervations I have made, will not grow to ſo great a magnitude in this climate as the former; but being amongſt the moſt beautiful of all the Evergreens, it well deſerves encouragement in the garden, as well as the wilderneſs.

CHAPTER XXX.

The *ILEX*, or EVERGREEN OAK TREE.

Being a ſpecies of the Oak, its character and deſcription of its flower and fruit will be found under that Head.

The SPECIES *are:*

1. The Olive-leaved EVERGREEN OAK.
2. The narrow-leaved EVERGREEN OAK, with ſerrated leaves.
3. The Holly-leaved EVERGREEN OAK.
4. The round ſmooth-leaved EVERGREEN OAK.

THERE are ſeveral other kinds of this plant; but being no other than ſeminal variations, are not worthy of being particularized.

I know no tree more difficult to tranſplant than the Ilex, as their roots, when not interrupted, run as ſtraight down into the earth as a carrot, and with as few fibres; ſo that for hedges, or large plantations, I would adviſe their acorns to be planted in the places where they are deſigned to remain.

If for hedges, let a border be well trenched, levelled, and raked the beginning of March, and make a ſhallow drill with a ſmall hoe, placing the acorns in it at the diſtance of three or four inches, and covering them about two inches deep, keeping the ſurface mellow and clear of weeds. Theſe plants make very little progreſs the firſt ſeaſon, and will not then bear being cut under ground, but will make ample amends ever after, by a luxuriant growth in any tolerable ſoil they like. After ſtanding two years, carefully draw out ſuch plants as ſtand too thick, leaving them from a foot to fifteen or ſixteen inches diſtance. In the next ſpring, the hedges will require ſome correction: At this time go over them, firſt pruning off any ſpreading or croſs-hanging branches near their tops, and afterwards let their ſides be clipped to the bottom with ſhears; but this muſt be cautiouſly done at firſt, and not too cloſe to their bodies; after which, by digging the borders for a few years, and ſhearing them annually, obſerving always to keep them light and thin in the tops, there is no plant I know of will ſo ſoon make warm and lofty hedges, to the height of forty or fifty feet, or ſo much improve a cold climate, and promote the growth of other trees.

If you intend a large plantation of theſe trees, either by themſelves, or mixed with others, let the ground be well cultivated, and put four or five acorns in patches together, at ſuch diſtances as you intend the plants ſhould ſtand. The ſecond April after planting, draw up ſuch as are not well thriven; and the third, you may begin pruning off any ill-placed branches, and part of the others where too thick.

The two years old plants, which you have drawn up, as ſoon as you have ſhortened their roots, plunge them into the pap for ſome hours, when they may be committed to a ſhady border in the nurſery, and laid in lines two feet aſunder, where, in a kindly ſeaſon, and by giving them frequent and gentle waterings, ſome of them will ſucceed, and in this ſituation they may remain three years.

I have been not a little diverted, to find writers on the culture of this plant ſagely adviſe, to raiſe the ſeedlings with balls of earth, when by nature they are deprived of any fibres, and it is to art they are indebted for them, being of the tap-rooted tribe, ſo muſt come from the beds, deſtitute of any earth.

But in order to be furniſhed with plants that will remove with ſafety, ſow their acorns on a good generous ſoil, in drills two and a half feet aſunder, and three or four inches in the drills; let their growth be promoted by ſeaſonable watering, and keeping the ground clean, ſweet, and mellow: The ſecond ſpring, clear away the earth from one ſide of the line of plants, about five inches deep, with a ſpade, and, with a ſharp knife, at that depth cut the roots acroſs, keeping the plant ſteady with the left hand, to prevent their being in the leaſt diſturbed, let the earth thrown up be immediately replaced, preſſing it gently with your hand or foot. This practice ſhould be repeated for three or four years, and the drills annually thinned as the plants increaſe in ſize; from this proceſs being well attended to, I have had great ſucceſs in removing numbers of them.

You may alſo raiſe the Ilex, by ſowing their acorns in pots, where, after remaining three or four years, they may be taken out with the whole ball of earth about them, and planted with abſolute ſafety where they are to remain: But this is an expenſive and tedious method, as ſuch would make but little progreſs, in compariſon with theſe in the open ground; beſides, the roots of the plants raiſed from ſeeds in pots, where they muſt remain for a long time, being all compreſſed in one cluſter, cannot be ſo eaſily diſengaged, therefore cannot furniſh plants as luxuriant as theſe, that from time to time have had their roots properly pruned, and room to extend them in the open ground. However unfavourable the ſowing the ſeed of the Ilex in pots has appeared, yet I would not from this have it underſtood, that I diſapprove of potting the young and tender plants, whoſe roots will not be ſo obſtinate, but may be increaſed by proper pruning, and brought forward ſo as to anſwer for particular purpoſes, but not for general uſe.

This ſpecies of the Evergreen tribe is very patient of cutting, ſo that, from three or four years old, they ought to be regularly pruned and formed, which will be found no very difficult taſk. I formerly poſſeſſed five of the largeſt Evergreen Oaks in Scotland, which ſtanding near a ſouth wall, in about twenty years old, began to overſhadow it, yet notwithſtanding I would ſooner have forfeited the advantage of twenty times as much walling, than hurt theſe trees; I made the experiment of pruning one of them, that I had on purpoſe ſuffered to grow almoſt in a ſtate of nature. This experiment I executed with great ſeverity, by cutting away all the large branches from the trunk, and ſeveral of the principal arms where the tree divided; from which I could diſcover no material check in its future growth, as the wounds ſuddenly healed.

After the plants that have been drawn from the lines, that were cut below the ſurface have ſtood three or four years in the nurſery, and the untranſplanted have remained as long, remove them to their proper ſtations for good, for from their being very hard in their root, and unwilling to puſh out any new fibres, any further proceſs in the nurſery will be unneceſſary. Let them be plentifully watered at removal, and let that be regularly attended to once a week during the warm ſummer months, ſhould the weather prove dry.

Though the attentive culture of this tree in ſuch a climate as ours, muſt be productive of many advantages, yet I would not adviſe their being planted near the houſe or gardens, as in April and May they caſt their old leaves, which occaſions a prodigious litter, and in that chearful ſeaſon appear ragged and gloomy.

The land they chiefly flouriſh in, as affirmed by ſeveral writers of conſequence, is a hazelly loam. This is a ſpecies of earth few plants will diſagree with, but is very far from being univerſal; for the Ilex will even ſucceed in a variety of leſs deſirable ſoils: Therefore I muſt affirm, from experience, that ſuch as are intended for tranſplanting, though they muſt be cultivated in a generous mould, in order to have them ſufficiently rooted for the purpoſe, yet they will grow freely in very ordinary ſoils, and particularly in that which is deep, (but not wet) though very coarſe and ſtubborn. They are indeed a little delicate at firſt, but ſoon become of the hardieſt tribe; therefore may be treated with the greater freedom.

When you intend any conſiderable plantation of this tree, or to incloſe an extent of ground with hedges, ſhould the ſoil be poor or ſtiff, I would adviſe, after you have dug or trenched it well, the beginning of winter, (according to its quality) to lay ſome rich mould on the poor, and looſe earth on the ſtiff ſurface of the border for hedges, or on the ſpots allotted for timber-trees, to be ſlightly pointed in the April before ſowing.

The wood of the Evergreen Oak makes excellent ſtocks for tools, mallet-heads, axle-trees, wedges, paliſadoes,——and ſupplies the greateſt part of Spain, and the ſouth of France, with the beſt and moſt laſting charcoal yet known.

CHAPTER XXXI.

THE CORK TREE.

The Cork Tree being no other than a ſeminal ſpecies of the Oak; for the character of its flower and ſeed ſee the Oak.

The SPECIES *are:*

1. The broad-leaved Evergreen CORK TREE.
2. The narrow-leaved CORK TREE, with ſmooth edges.

THE beſt Engliſh writer on this ſubject, has directed theſe plants to be propagated in all reſpects like the Evergreen Oak. About London indeed, which, from a variety of circumſtances, is a very different climate from any other part of Great Britain, this practice may anſwer; but in the remote counties of England, and in Scotland, to my certain knowledge, it will not, for they make ſo little progreſs in the firſt ſummer, that the following winter forces them out of the ground, or otherwiſe deſtroys them: But in the manner I ſhall here direct, I have raiſed many trees that grew with great vigour.

Let the goodneſs of your acorns be made trial of, as has been directed for the common Oak, that there may be as little blanks as poſſible in the crop. In the beginning of March, prepare a ſhallow box, according to the number of plants you intend to raiſe; let the bottom of the boxes be pierced with holes half an inch diameter, at four or five inches aſunder, and covered with oyſter-ſhells or broken tyles; put five inches deep of fine rich light mould in them, on which place your acorns about four inches aſunder, and cover them with two inches more of the ſame kind of mould; place theſe boxes on a moderate hot-bed, of tanners bark; and in ten or twelve days, when you find the earth beginning to dry, give it a very gentle ſprinkling of water, which is to be repeated every fourth or fifth day. In a month after ſowing, the plants will begin to appear, when the quantity of water muſt be increaſed, but how much, or how frequently, the condition of the earth will beſt direct you. In this hot-bed the box muſt remain until the beginning of July, then to be removed, and placed in a ſhady ſheltered ſituation during the remaining ſummer months; but obſerve, before you move them from the hot-bed, that they be gradually inured to the open air, by taking off the glaſſes in mild or moiſt weather, when the ſun rays are not too ſtrong, and late in the evenings, or all night, when the weather is temperate. On the approach of winter, with your fingers, clear the ſurface of the boxes of all muſty particles, to be replaced with a greater proportion of fineſt rich mould; when they are to be placed under frames until the ſucceeding ſpring, and are only to cover them with the glaſſes in violent rains or hard froſts.

From the middle of April to the beginning of May, as the weather ſooner or later becomes favourable, let the boxes be moved to a well-ſheltered, but ſhady place in the nurſery, and placed on ſtones or logs of wood ſome inches above the ſurface of the ground, which not being attended to, is apt to occaſion ſuch a ſtagnation and corruption in the mould in the boxes, as frequently to deſtroy the plants, or at beſt to ſtunt them beyond recovery. During the ſummer months, let them be regularly refreſhed with water as the ſeaſon requires; and in the autumn, (though it may not often be neceſſary), I would chuſe to place them under the protection of a frame, which may be covered in very ſevere winters.

In the beginning of the following April, the plants being now two years old, they muſt be taken out of the boxes, when, from the interruption their ſtraight roots have met with, in not running downwards, they may be carefully undermined with a trowel, ſo that they may be raiſed with earth adhering to them. This being done without wounding the ſmalleſt fibre, put them in penny-pots filled with rich looſe mould; plunge the pots into a moderate hot-bed only for ſix weeks or two months, till they have puſhed out freſh fibres, and are in a briſk growing ſtate. They muſt be gradually hardened, and then placed in the north border of the garden during the remaining part of the ſummer. After this theſe plants will require no more than common culture, and, having ſtood two years in the pots, may be ſhaken out with their whole balls of earth, and either planted where deſigned to ſtand for good, or in the nurſery to remain two or three years more, for future deſigns, from whence they will remove with eaſe and ſafety.

Though this proceſs, to an inactive gardener, may ſeem troubleſome, yet it is not very expenſive; and I am certain I have not directed the leaſt ſuperfluous labour for the reconciling them to our climate and ſituation.

The Cork Tree, in its native ſituation, is ſaid to grow on the bleakeſt mountains, and poor, rocky, ſteril ſoils, with their roots running above the ſurface; but theſe ſoils and ſituations muſt have ſome happy animating qualities belonging to them, not to be found in our northern regions, to which we muſt familiarize them, before we can expect to have them grow freely; if your intention is to have them of any conſiderable magnitude, you muſt give them a good ſolid generous ſoil, and a ſituation defended, either by nature or art, from the cold eaſterly and northerly winds.

The uſes of cork, which is the bark of this tree, is ſo univerſally known, as to render it unneceſſary to point it out. Its body being hard, laſting, and beautiful, like the Ilex, it makes excellent charcoal.

CHAPTER XXXII.

THE HOLLY TREE.

A Deſcription of its Flower and Seed.

They have male, female, and hermaphrodite flowers on different plants. The male flowers have a ſmall permanent empalement of one leaf, which is indented in four parts; they have but one petal, which is cut into four ſegments almoſt to the bottom; they have four awl-ſhaped ſtamina, which are ſhorter than the petal, and are terminated by ſmall ſummits. The female flowers have their empalements and petals the ſame as the male, but have no ſtamina; in their centre is placed the roundiſh germin, having four obtuſe ſtigmas ſitting on it. The germin afterward becomes a roundiſh berry with four cells, each containing a ſingle hard ſeed.

The SPECIES *are:*

1. The common HOLLY, with red berries.
2. The ſmooth ſhining-leaved HOLLY, with red berries.
3. The yellow-berried green HOLLY.
4. The white-berried green HOLLY.
5. The green Hedge-hog HOLLY.
6. The yellow-blotched Hedge-hog HOLLY.
7. The gold-edged Hedge-hog HOLLY.
8. The ſilver-edged Hedge-hog HOLLY.
9. The yellow-blotched HOLLY.
10. The white-blotched HOLLY.
11. Broderick's HOLLY.
12. Eales's HOLLY.

13. Sir Thomas Franklin's HOLLY.
14. Hertfordſhire white HOLLY.
15. Bridgman's HOLLY.
16. Longſtaff's beſt HOLLY.
17. Bradley's beſt HOLLY.
18. Wiſe's beſt HOLLY.
19. The Britiſh HOLLY.
20. Bagſhot HOLLY.
21. Glory of the Eaſt HOLLY.
22. Glory of the Weſt HOLLY.
23. Aſlet's HOLLY.
24. The Union HOLLY.
25. Fine Phyllis HOLLY.
26. Painted Lady HOLLY.
27. Fuller's cream HOLLY.
28. Milk-maid HOLLY.
29. Capel's molted HOLLY.
30. Patridge's HOLLY.
31. Maſon's copper-coloured HOLLY.
32. Box-leaved HOLLY.
33. Whitmell's HOLLY.

HOLLY BERRIES are uſually gathered ſoon after they are turned red, which is early in autumn, but they are by no means ripe at this ſeaſon, and ſhould at leaſt hang on the trees until December; for, were it not for the birds, who greedily devour them, I would not adviſe pulling them until February or March, during which time they would improve in maturity.

The common method of raiſing the plants, is by ſowing their berries whole, either as ſoon as taken from the tree, or the following ſpring; but of this I by no means approve.

For the berries containing each four ſeeds, the ſowing them whole, (if the ſeeds were good) neceſſarily produce four plants interwoven in one cluſter, and in the ſeparating them, ſome of the plants may be injured.

Therefore, in order to prevent any ill conſequence from this practice; as ſoon as your berries are gathered, throw them into a tub of water, and rub them between your hands until they are diveſted of their thick glutinous covering, which will be ſoon executed. This being done, teem off whatever ſubſtance floats with the water, what remains ſpread on a cloth in a dry airy place, to be frequently rubbed between your hands, daily changing their ſituation, until the ſeed are ſeparated and quite dry. If this is done in autumn or winter, be careful to mix the ſeed with ſand, to be preſerved from any wet or moiſture until ſpring; but ſhould they not have been gathered until ſpring, let them be immediately ſown, firſt diſengaging the ſeed from the pulp and covering, which may be eaſily performed by a ſimilar operation of that juſt directed.

The moſt ſeaſonable time for ſowing the ſeed will be in March or April, and as regular as poſſible, on a ſpot of well-prepared rich looſe mould, in beds three and a half feet broad, with alleys of eighteen inches between them, to be covered to the depth of three quarters of an inch; and as the ſeed will not vegetate until the ſucceeding ſpring, let the ground be kept clean, ſweet and mellow, until autumn, when the ſurface of the beds muſt be looſened with a ſhort-toothed rake, and a little fine freſh mould thrown over them, which may be raked off in the following ſpring, before the ſeed are in any ſenſible motion.

In the beginning of the following April, draw out a conſiderable number of your Hollies, then one year old, leaving the remainder ſo thin that they may receive all the influences of air, ſun, and rain; let the plants drawn up be placed in a ſhady border, of lines eighteen inches diſtance, and five or ſix in the line, giving them frequent but moderate waterings, and pointing over the ground in autumn and ſpring. The reaſon of allowing ſo large a ſpace to theſe plants, which for two or three years will be very ſmall, is for the greater convenience of digging between the lines, which will greatly invigorate the growth of the plants, and encourage their ſide-roots to ſpread, ſo as to riſe with good balls of earth to each. In this ſituation they may remain three years.

The plants in the ſeed-bed, being now two years old, muſt be removed; and having cautiouſly ſhortened their downright, and ſmoothed the extremities of the ſpreading roots, plant and otherwiſe cultivate them as the former, only in this nurſery they ought to continue but two years.

In a tolerable ſoil, and a protected ſituation, theſe Hollies may be planted out for hedges, neglecting not to cut them down to the ground, and watering them; but in poor land and in unſheltered ſituations, they will ſucceed much better, by giving them more ſtrength from age, and culture in the nurſery.

Therefore, to do this effectually, move your plants to another quarter of well-prepared freſh earth, and plant them in lines three feet aſunder, and eighteen inches in the line. At this time let them have a plentiful watering, keeping the ground as formerly, and here let them continue untouched for two years. The third ſpring, uncover one ſide of the plants, and with a ſpade made very ſharp, cut off all the downright roots at ten inches or a foot below the ſurface, and at the ſame time ſhortening all ſtraggling roots that extend far from the ſides; then replace the earth, and dig it well about them. Having ſtood here another ſeaſon, cut them down to the ground; and the following, which will be the fourth year, they may be removed where you intend, without the loſs of one in a thouſand.

The beginning of April, having prepared the borders where you deſign planting your hedges, let the Hollies be carefully raiſed with their balls of earth about their roots, which will by this time be pretty conſiderable, if the culture which I have directed has been followed. The roots at this time, will require no other attention than with a ſharp knife, to cut off ſmooth any of the fibres that have been broken or bruiſed with the ſpade in raiſing the plants; let them be kept as little time as poſſible out of the ground, plant them at eighteen inches diſtance, and to the ſame depth they were before planted; give them a plentiful watering, and ſhould the weather prove dry, it muſt be repeated once in ten or twelve days, for three or four times. The plants being cut down the preceding year, will have made ſhoots from a foot to eighteen inches high; theſe you are to reduce to about ſix or eight inches above the former year's cutting; and thus you may have a hedge ſormed, that requires no further trouble than keeping the roots of the plants clean for a few years, and annually clipping them, which, in an ordinary ſoil, will, in ten years, defeat the attempts of the ſtrongeſt bull to penetrate it.

I have likewiſe planted the Holly and Thorn mixed in hedges with moſt deſirable ſucceſs, every third or fourth plant being a Holly. The Thorns, for four or five years, will advance faſteſt, after which the Hollies will annually gain ground, and at laſt totally extirpate the others, ſo that by planting both, you will ſooner have an appearance, and afterwards, by an agreeable metamorphoſis, have an entire Holly hedge.

Having mentioned the Holly only for hedges, of which it makes the ſtrongeſt, warmeſt, moſt laſting and beautiful, for outward fences, of any plant this climate produces; yet I am far from intending to confine it to that purpoſe alone, as I know none will more adorn, or be otherwiſe more uſeful, not only in the garden and wilderneſs, but the more extended woods and foreſts. For theſe purpoſes, at the laſt removal directed for the hedge plants, let ſuch a number of the talleſt and cleaneſt ſhoots, as your deſigns require, be ſelected, from which cut away all but the leading ſhoots, and plant them in another nurſery of freſh earth, in lines five feet aſunder, and two and a half in the line; cultivate the ground about them by digging and dreſſing it, and annually prune the trees to their proper form; in which ſituation they may continue ſeven or eight years, raiſing part of them from time to time, as your plantation require.

The general neglect of cultivating this beautiful plant, both in the hedges and woods, is not a little amazing, when its many uſes and good qualities are conſidered; and I can no otherwiſe account for this diſregard, than from the number of miſcarriages that happen by not attending to its proper culture, which would give a moſt aſſured ſucceſs. Their common treatment is to remove them from the ſeed-bed (where they are raiſed gerally too thick) at two, three, and ſometimes four years old, and dibbling them, (ſtill immoderately thick), where they often continued four, five, or ſix years, according to the demand. By this practice their roots are bad, their bodies tall and ſlender, and their tops heavy, ſo that the gentleſt breeze of wind, will ſhake them to their foundation, from which every fibre they have puſhed out is immediately deſtroyed, when the plants muſt of courſe periſh: But by following the practice here directed, the winds make no impreſſion on them, nor is there in nature a hardier tree, one that roots better, is more patient of cutting both in the root and body, or that may be planted with more undoubted ſucceſs, from one to twelve or fifteen feet high.

The Holly tree, in a ſoil it affects, will grow upwards of fifty feet high, and even to a conſiderable ſize, and in as great a variety of ſoils as any plant I know. It refuſes not the pooreſt, hot, ſandy, gravelly, and rocky ground, nor the coldeſt ſpoutty clay and till; and its beautiful ſhining leaves, almoſt covered with rich ſcarlet fruit, which the ſevereſt winter does not diſcolour, makes it in a particular manner, at that ſeaſon, a moſt grateful and deſirable ſight.

Though I have juſtly reported this as one of the hardieſt plants, when it has been properly cultivated, and has once got a good footing, yet where hedges of it are planted on extremely poor and hungry land, particularly that which is ſtiff; let a ſmall mixture of rich ſandy or gravelly ſoil (but by no means dung) be mixed in the borders, this will much promote their early rooting, which being once put in a free-growing ſtate, they will afterwards require no further aſſiſtance from art.

I muſt not here omit taking notice of a very wrong, though prevailing cuſtom, which is, the clipping theſe hedges the beginning of winter. This has various ill effects, as it not only robs them of their beauty and verdure in that gloomy ſeaſon, by cutting away the freſh tender ſhoots, and mangling the leaves, but likewiſe expoſes the naked hearts of the plants to all the rigour of ſtorms, diſpoſſeſſed of their natural cloathing. Let this, therefore, never be performed later in the ſeaſon than July, then the young ſhoots will have time to be matured, and give the neceſſary protection when the ſevere weather approaches.

Any deſcription I am capable of giving in favour of the Holly hedges, will fall infinitely ſhort of the impreſſions every gentleman of taſte muſt conceive, who may have an opportunity of ſeeing an old fence of them, that has been properly trained. I am much concerned I cannot gratify the public with many examples of this kind; but happily there is one in Scotland, that will juſtify the higheſt encomiums of the ableſt writer on that ſubject, which is to be ſeen at Tynningham, in the county of Eaſt-Lothian, the ſeat of the Right Honourable the Earl of Hadinton, and to a view of them I appeal, as the cleareſt evidence of their incomparable beauty, laſting ſtrength, and magnificence. But how much nobler an appearance muſt this plant make, when ſtanding unconſtrained by the ſhears, detached and at freedom in the woods, loaded as they annually are with berries, (which clipping prevents), is not eaſily conceived. Theſe hedges were planted by the late Earl of Hadinton, the greateſt, moſt knowing, and moſt ſucceſsful planter of his time, and who, to all appearance, from a very poor and unpromiſing ſoil, expoſed to, and cloſe upon the great German ocean, has raiſed very extenſive and flouriſhing plantations of the moſt valuable Foreſt-trees. What I have ſaid in regard of the hedges at Tynningham, I hope, will not be diſpleaſing or conſidered as a digreſſion from my plan; however, to keep within the line of my ſubject, I do moſt humbly recommend to the preſent Earl, (the proprietor) to allow ſome part of theſe hedges (which at preſent I think are not lofty in proportion to their thickneſs and ſtrength) to run up to twenty-five or thirty feet in height; to be cut thinner and thinner as they approach the top, which in a few years would make them the moſt glorious ſight of the kind that can be conceived, and this may be done without the leaſt injury to the ſtrength of the trees, but add to the beauty of their appearance, and be a moſt indiſputable evidence of what I have aſſerted, in favour of this line of improvement.

The great variety of variegated Hollies for the wilderneſs or Evergreen garden, are likewiſe all highly worthy our attention, not clipped or reduced to any exact form, but, when properly pruned, ſuffered to grow in their natural luxuriance of branches and fruit. The variegation of trees in general, proceeds from ſome weakneſs or diſeaſe, which occaſions their being dwarfs, and when planted in ſtrong land, loſe much of their beauty, and often turn plain: But in the Holly it is quite otherwiſe; they grow to a large ſize, and the moſt generous ſoil does not in the leaſt diminiſh the mixture of their colours, but makes them more brilliant; ſo that the variations of this tree is very unlimited, and when diſpoſed of by a good taſte, affords, at all ſeaſons of the year, a gay and pleaſing appearance.

There has been many directions given, (with much ſolemnity and aſſurance of ſucceſs,) for variegating Hollies from the ſeed, many of them I have tried, which I have found equally ineffectual with my own experiments; from hence I can ſafely aver, they are all quackiſh impoſitions, and that they can only be increaſed by budding or grafting them on the plain green kind, in both which they will readily ſucceed; but their variegation by any other means, is a ſport in nature, which no art has as yet been able to imitate.

I have raiſed the different kinds of Hollies from layers, and even from cuttings: But the purſuit of either the one or the other, I do not recommend, as they are not only extremely tedious in their growth, but I never was yet able to make good plants from them.

The timber of the Holly is exceeding hard, and of all ſtrong woods the whiteſt: It is uſeful for many laſting purpoſes; the mill-wright, turner, and engraver, prefer it to any other; it makes the beſt handles and ſtocks for tools, flails, bowls, bolts for doors, nay they even make hinges of it inſtead of iron, and it is ſo heavy, that, like iron, it ſinks in water.

The Box tree I would likewiſe recommend for the wilderneſs, or any plantation where they may ſtand near each other, or be cloſely planted with other trees, which will make them depart from their dwarfiſh nature, ſpindle and run up, when they may be improved afterwards in bulk and thickneſs by clearing them of their ſhelter; when woods or coppices are cutting down, they ſhould be ſuffered to ſtand to encreaſe in magnitude, which they will by the time the coppice comes into growth, during this time they will not only preſerve a verdure on the ground, but give a degree of vivacity to a place that otherwiſe would appear all deſolation; and when cut down, afford an abundant return to the planter, from the value of its wood for many purpoſes, which occaſions an import of great quantities from Turkey, &c.

CHAPTER XXXIII.

The YEW TREE.

Deſcription of its Flower and Seed.

The male flowers are produced on ſeparate trees from the fruit of the moiſt part; they have neither empalement or petals, but the gem is like a four-leaved cover; they have a great number of ſtamina, which are joined at the bottom in a column longer than the gem, terminated by depreſſed ſummits, having obtuſe borders and eight points, opening on each ſide their baſe, caſting their farina. The female flowers are like the male, having no empalement or petals, but have an oval acute-pointed germin, but no ſtyle, crowned by any obtuſe ſtigma. The germin afterward becomes a berry lengthened from the receptacle, globular at the top, and covered by a proper coat at bottom, open at the top, full of juice, and of a red colour; but as it dries, waſtes away, including one oblong oval ſeed, whoſe top without the berry is prominent.

The SPECIES *are:*

1. The common YEW TREE.
2. The YEW TREE, with a broader and more ſhining leaf.
3. The YEW TREE, with ſtriped leaves.

THE firſt and ſecond ſorts are indiſcriminately propagated together: They may be raiſed by ſowing their berries in beds three and a half feet broad, with alleys eighteen inches between them, on any ſpot of well prepared freſh ground. Should this be done in the beginning of winter, as ſoon as the berries are ripe; firſt diveſt them of the pulp in which they are incloſed, when numbers of them will appear the following ſpring; but as theſe will be in a weak ſtate; I would adviſe their ſeed to be treated as that of the Holly, that is preſerved in ſand as ſoon as diveſted of its pulp, to be ſown the following ſpring, and managed in the ſeed-bed for two years, and three more in the nurſery, as has been directed for the Holly.

The Yew may likewiſe be propagated from cuttings of one or two years growth, planted the beginning of April or the end of Auguſt, in a ſhady border; let them be laid in lines eighteen inches aſunder, covered five inches deep, and watered at planting; be careful to rub off the leaves as far as the cuttings are buried, and, in two years, they will be well rooted, and fit for removal. Branches torn from the joints, are better than plain cuttings.

The plants from ſeed being five, and the cuttings two years old, (though ſtill ſmall), remove them to another nurſery, ſhortening their downright roots, and lay them in lines two feet aſunder, and nine or ten inches in the line, to remain three years.

From thence remove them again, and plant them in lines four feet aſunder, and two feet in the line, giving them a plentiful watering, which, if the weather is dry, muſt be repeated once a week, for three or four times; and here they may continue, if the ſoil is rich, four years, but if poor, five or ſix, during this time they muſt be pruned, to rear them for ſtandards, or to be clipped for the hedge, ſuitable to your intentions. Let the lines be carefully dug every ſpring, as it will much contribute, not only to encreaſe their growth, but multiply their roots.

If deſired of a larger growth, you muſt once more remove them to another quarter, and plant them at eight feet diſtance by ſix, continuing the ſame culture as before; from hence you may remove them any time, within ſeven or eight years.

No plant is more patient of being tranſplanted when old, than the Yew; it naturally produces great quantities of ſmall roots, to which the earth adheres ſo cloſely, that, with plentiful waterings, you may at once form complete hedges of ſeven or eight feet high, that will not in the leaſt degree be retarded in their growth by removal, but have the ſame freſhneſs and verdure the firſt ſeaſon, they ever had.

There is not in nature of the hardy tribe, a tree ſo patient and obedient to the ſhears as this, or that makes ſo cloſe and warm a defence againſt the cold piercing winds, (the Holly only excepted, which making a great deal of litter in the ſpring, is not ſo proper for the inward diviſions of the garden), and therefore none ſo eligible for making ſmall incloſures in the kitchen ground or nurſery, to protect and forward vegetable crops, or young and delicate trees and ſhrubs. Of what mighty advantage ſuch fences would be to men of fortune, if attended to, when laying out their improvements, may eaſily be imagined; and I muſt obſerve, that they are too much neglected by the nurſeryman, whom they would particularly be-friend, in rearing their tender crops.

With all theſe advantages, I muſt acknowledge the Yew to be a very unchearful plant; and the practice of planting numbers of them, cut in a variety of ridiculous figures, in the courts and fronts of houſes, rendered them doubly mournful, and has no doubt increaſed the diſregard ſhown them: But for the purpoſes I have juſt recommended them, they cannot be too much encouraged; neither do I think they ought to be entirely baniſhed the wilderneſs or foreſt, where a few of them in their natural ſtate, interſperſed with other trees, would appear with a reverend though gloomy magnificence, and would be the fineſt foil imaginable to the reſt of the plantation, when contraſted with them, will appear with additional chearfulneſs and luſtre.

I have already mentioned the ill conſequence of clipping Holly hedges in autumn. This ought to be yet more particularly attended to in reſpect of the Yew, which will be injured more by that application, than I have known them to ſuffer in the ſevereſt winters, as whole hedges of them become quite brown, and ſo weakened, that nothing but cutting them cloſe to the trunk, would again reſtore them to their verdure.

This tree, when ſhooting in the ſpring, or in autumn loaded with berries, is hurtful to cattle, which, at theſe ſeaſons, they ſhould not be ſuffered to aproach; however, the ſpecies with us, is not the true Taxus, or Yew of the Ancients, to which they aſcribed ſo many deadly qualities. Mr. Evelyn, in his Silva, mentions a tree of it growing in his time, in the Medical Garden at Piſa in Tuſcany, of ſo baneful a nature, that the gardeners could not clip it for more than half an hour at a time, as it occaſioned them to be attacked with a violent head ach. The leaves of this tree are deſcribed to be more like the Fir than our Yew, and this account of it is given by Doctor Belluceus, Preſident of theſe gardens. I acknowledge the emiſſions of our Yew, when clipped, to be no regale, but luckily it has not the malignant effects of the Tuſcan.

This tree grows to a large ſize, is hardy in reſpect of cold, and will ſucceed in the moſt barren and mountainous ſituations, where the greateſt ſtorms will make no impreſſion on it. Since the uſe of bows has been laid aſide, the wood is in leſs eſtimation than formerly; but ſtill it brings a high price from the cabinet-maker. Poſts of it ſet in moiſt ground, will continue ſound for ages, and for axle-trees no wood is ſo ſtrong and laſting; to which I ſhall only add one other very material quality, which has not yet been noticed, which is, that beds made of this wood, will not be approached by bugs. This is a truth, in the knowledge of my own practice, as I had them cut down and uſed for the purpoſe in my family.

CHAPTER XXXIV.

THE *LAUREL*, OR CHERRY BAY TREE.

A Deſcription of its Flower and Seed.

The empalement of the flower is bell-ſhaped, of one leaf, indented in five parts at the brim, which ſpread open: The flower hath five large roundiſh petals, which ſpread open, and are inſerted in the empalement. It hath from twenty to thirty awl-ſhaped ſtamina, which are inſerted in the empalement, terminated by roundiſh ſummits, and a roundiſh germin ſupporting a ſlender ſtyle, crowned by an entire obtuſe ſtigma. The germin afterward becomes a roundiſh fruit, incloſing an oval-pointed nut having rough furrows.

The SPECIES *are:*

1. The common LAUREL.
2. The white-ſtriped LAUREL.
3. The yellow-ſtriped LAUREL.
4. The Portugal LAUREL.

THE common Laurel is to be propagated either from ſeed or cuttings; but as thoſe from ſeed make the moſt uniform ſtately trees, and ſooneſt produce their fruit, ſo, where they are required of a large ſtature, I would adviſe their being propagated in that way, which I ſhall firſt direct.

In the beginning of winter, ſoon after the berries are ripe, ſow them in a ſhady border of well-prepared freſh looſe mould, in beds three and a half feet broad, with alleys of eighteen inches between them, and cover them an inch and a half, or two inches deep. In the beginning of the following March, before their vegetation begins, rake off as much of their covering as may be done without diſturbing the ſeed, and replace it with freſh earth, to the depth of about three quarters of an inch. About the middle of April, when the ſeed will be in a growing ſtate, the weather being dry, and not froſty, refreſh them in the morning with frequent but gentle waterings; continue this, more or leſs, during the ſummer months, as the ſeaſon ſhall require, changing the morning to the evening watering as ſoon as the danger of the froſts are over.

The ſucceeding ſpring, the ground being good, and the former ſummer having been favourable, as ſoon as their buds begin to ſwell, remove them from the ſeminary to the nurſery, and lay them with the ſpade in lines two feet aſunder, and nine or ten inches in the line, and in the ſame depth they formerly ſtood; water them at planting, and if you repeat it three or four times at the diſtance of ten or twelve days, the ſeaſon being dry, it will much forward their growth: Let the ground between the rows be pointed over in autumn and ſpring, and cut away any croſs lateral branches while they are in this culture, which muſt be no more than two years. Should the berries have been ſown in poor land, the plants of courſe will have made but a ſmall progreſs; in that caſe, and provided they are not too thick, they may remain in the ſeed-bed for two years.

To raiſe them from cuttings; about the beginning of April, or middle of Auguſt, plant them in a ſhady border of moiſt (not wet) earth, in lines two feet aſunder; let the cuttings be a foot or fourteen inches long, one half of which ſhould be buried in the ground, firſt rubbing off the leaves, which otherwiſe would look unſeemly a great part of the ſeaſon, and by corrupting would taint the plants. Here they are to remain until the ſecond April, giving them the ſame culture as the ſeedlings.

With reſpect to cuttings of theſe, and all other trees, I muſt here take the liberty to notice a circumſtance I have never yet obſerved to have been attended to in practice, notwithſtanding it is of the higheſt importance in the culture of every plant raiſed from them; which is, the taking indiſcriminately all branches of a proper age and ſize, without conſidering the manner and diſpoſition of their growth: Though nothing is more certain, than that a clean upright ſhoot will produce a ſtraight handſome plant, and that an ill-formed bruſhy one will continue its original likeneſs, and thoſe that ſpread and hang over or have an horizontal inclination, will ever after continue to grow in that direction. I have planted perhaps as great a number of cuttings, and as great a variety as any man in my way; and after having firſt conſidered the order of nature, I determined to try its uniformity in a ſucceſſion of experiments, ſo planted the three different diſpoſed cuttings in ſeparate lines, when, after many years growth, the diſtinction was as perceptible in the plants reared, as in the trees they were taken from, verifying what the poet ſays of education—" Juſt as the twig is bent, the trees inclined,"

clined," and which is not leſs viſible in plants than in men. This leads me to obſerve, that gardeners for want of this attention in their choice of cuttings, ever give ſeedling-plants of all kinds a preference. That many plants raiſed from the ſeed have the preference of many others, is not to be diſputed, but to be univerſally ſo, is what I muſt contend againſt, for cuttings that will root well and eaſily, are litle inferior, when properly choſen. But to return to the further culture of the Laurel, I am now engaged with, every circumſtance eſſential and favourable ſhould be attended to, particularly as they give an advantage in time to forward whatever may be the undertaking, anticipating nature, and as it were lengthening the life of Man, by bringing forward his undertakings much earlier than they would otherwiſe be, was nature alone to be purſued without the aſſiſtance of art.

The ſeedlings and cuttings may now be treated in the ſame manner, and removed to another nurſery, where, plant them in lines four feet aſunder, and two feet diſtant in the line; but firſt ſhorten and cut away all ill-placed roots, and ſuch as croſs each other, carefully pruning the ſuperfluous branches, but preſerving and encouraging the principal leading ſhoot; take care to cultivate the ground as already directed; and annually prune them in ſuch a manner as will moſt encourage them to a pyramidical form: In this nurſery they may continue three years, but not to exceed four. I have as yet only directed in regard to ſuch as are intended for tall ſtandard trees; but ſuch as are intended for covering of walls, forming hedges, or other like purpoſes, may either be ſo trained from the nurſery, or further proceeded with, ſo as to anſwer your future deſigns. This tree by ſuffering it to grow rude too long, becomes ſtunted and of a very irregular figure, when they are paſſed being recovered, or brought to a proper form, as they are much injured by cutting their old wood.

Theſe trees from the culture they have now undergone, will be of a competent ſize; but if a reſerve is intended for diſtant deſigns, remove them to another ſpot, planting them in the quincunx order, at ſix feet aſunder, obſerve to attend to their former culture; where, after ſtanding two years, they may be removed with ſafety at the diſtance of five or ſix years.

The two ſorts with ſtriped leaves may be increaſed by cuttings; but their variegation being very faint, they will ſoon become quite plain in a luxuriant ſoil, and ought therefore to be planted in a poor, hungry, dry ſand or gravel. The better to blend their colours than they naturally are, render them more glaring, and of longer continuance, remove them annually, for five or ſix years, into poor land, budding a richly-variegated leaf on the green, or rather a variegated ſtock, which will much brighten their colours, and give them a greater ſtability than if raiſed from cuttings.

The Portugal Laurel will not riſe to half the magnitude of the others, nor is it ſo eaſily reared into the pyramidical form, but is a beautiful and elegant plant, of a very chearful ſhining verdure. It may be propagated either by ſeed, layers, or cuttings, as directed for the other ſpecies, but, when young, are more delicate, and will be improved by a higher culture, better ſoil, and more ſheltered ſituation for four or five years, after which it will be abundantly hardy.

With the beauty of the common Laurel, we are little acquainted, as we have not grown them for any other purpoſe, than to have them mangled on walls and in hedges, or in clipped buſhes, which, from the fulneſs of their leaves, are of all plants the leaſt proper for that treatment; They will grow to the height of between forty and fifty feet, and ſucceed in very poor barren ſoils. Of all the Evergreens familiar to this climate, I have ever eſteemed them amongſt the moſt graceful: They have all the beauty of the Orange tree without its fruit; and I cannot conceive a richer appearance in nature, than a number of lofty Laurels, that have been properly trained, and planted near a houſe, whether in ſingle trees, in groves, or interſperſed with other Evergreens in the wilderneſs way.

It unites perfectly well with the common black Cherry, either by grafting or budding, which will conſiderably increaſe its magnitude, as well as render it hardy.

CHAPTER XXXV.

THE BAY TREE.

A Deſcription of its Flower and Seed.

It hath male and hermaphrodite flowers on different plants, the male flowers have no empalement: They have one petal, which is cut into ſix ſegments at the top, and nine ſtamina which are ſhorter than the petal, ſtanding by threes, terminated by ſlender ſummits. The hermaphrodite flowers have no empalement; they have one petal, which is ſlightly cut into ſix ſegments at the top. In the bottom is ſituated an oval germin, ſupporting a ſingle ſtyle of the ſame length with the petal, crowned by an obtuſe ſtigma, attended by ſix or eight ſtamina: There are two globular glands, ſtanding upon very ſhort foot-ſtalks, fixed to the baſe of the petal. The germin afterward becomes an oval berry with one cell, incloſing one ſeed of the ſame form.

The SPECIES *are:*

1. The common BAY TREE, with male flowers.
2. The common fruit-bearing BAY TREE.
3. The broad-leaved berry-bearing BAY TREE.
4. The gold-ſtriped BAY TREE.

THERE are ſeveral other ſpecies of the Bay tree, but being very tender plants, and confined to the green-houſe during winter, are foreign to the deſign of this Treatiſe.

The three firſt ſorts mentioned may be either propagated from ſeed or layers, and will make good plants in either way. Their berries are commonly ripe the end of January, or the beginning of February, when they ought to be gathered and preſerved in dry ſand until the beginning of March. The weather being then favourable, or as ſoon as it may, prepare a ſhady border of rich, looſe, undunged ſoil, to be made ſmooth and fine with the rake, and well protected by hedges from the north and eaſt winds; here drop the berries in lines fifteen inches aſunder, and about four inches in the line, ſifting over them ſome of the fineſt and richeſt mould, to the depth of an inch. As ſoon as you perceive the plants begin to heave up the earth, refreſh them frequently, (but moderately) with water, in the mornings when cold, but in the evenings of mild weather, continuing this practiſe all the ſummer months; clear the ground of all muſty particles in autumn and ſpring, as directed for other ſeedlings, and let them remain here two years, watering them the ſecond ſummer (though more plentifully) with the ſame attention as the firſt, it being of the utmoſt conſequence to promote the vigorous growth of this plant in its early ſtages, which ſhould it then be ſtarved for want of proper ſoil and culture, will become hidebound, and will hardly ever after make a ſtraight handſome tree.

Such as you intend to increaſe by layers, may be laid down in March, or Auguſt, the latter of which is much the beſt ſeaſon, as thoſe laid down in March will be but indifferently rooted by the ſucceeding ſpring; but the others will be prepared to root vigorouſly early the following ſeaſon,

ſon, and by the ſecond ſpring will make ſtrong healthy plants.

The Bay will alſo grow from cuttings, provided they are torn aſunder at the joints, and planted in a ſhady border; in the open ground, their advance will be ſo very tedious that they will require ſtanding four years at leaſt before they can be removed, and notwithſtanding this care, they grow thick and bruſhy, never making ſuch handſome plants as either the ſeedlings or layers; but I have raiſed thouſands of them in frames with the greateſt advantage, by the following proceſs: In the beginning of April, prepare a moderate hot-bed of tanners bark, and cover it eight inches deep with ſuch ſoil as directed for the ſeedlings. In this plant the cuttings five inches deep, and eight or nine inches aſunder, rubbing off all their leaves; let them have a gentle watering every evening while the bed continues warm, which may be gradually diſcontinued, as the warmth of the bed decreaſes; cover the glaſſes with mats during the heat of the day; when the bark has loſt its ſtrength, and the cuttings have made young ſhoots, let them receive all gentle ſhowers, and the evening dews. About the beginning of Auguſt, the glaſſes may be taken off the frames, to be replaced again when the weather begins to be froſty, but kept open every mild day. In the beginning of the following April, or as ſoon after as the weather becomes temperate, remove both the glaſſes and frames; continue frequent and plentiful waterings during the ſummer months as the weather may require, and the ſucceeding April you will have ſtrong well-rooted plants, fit for removal. By this proceſs, I have raiſed clean-bodied Bays three feet high in two years, which unaſſiſted nature would not have effected in four.

The plants raiſed in theſe three different ways, may now all be treated in the ſame manner, and removed to the nurſery; when, having cut away their ſuperfluous roots and branches, attentively encouraging the leading ſhoot, plant them in a well-ſheltered quarter of light mould, in lines three and a half feet aſunder, and eighteen inches in the line: In this nurſery give them all poſſible culture, by digging the ground in autumn and ſpring, and keeping it clean, looſe, and mellow in ſummer, ſo as to increaſe their roots, and prune them annually in April to a pyramidical form. Here let them continue three years, but not to exceed four, when they may be removed to the places where they are deſigned to remain for good: and notwithſtanding theſe trees may be removed at a greater age, yet I have found from experience, that this is the moſt proper time, in order to raiſe them to their greateſt height.

The gold-ſtriped Bay is of much humbler growth, and tenderer than the ſorts already taken notice of. It is commonly kept in pots, and houſed in winter with hardy green-houſe plants, tho' I have preſerved it in the open ground, for many years ſucceſſively, under the protection of other hardier Evergreens; but in ſevere winters it has been tarniſhed, ſometimes loſt its leaves, and even the young and tender branches have been deſtroyed, yet the ſucceeding ſummer repaired this misfortune. It is a very ſtrong rich variegation, and ought to be in all good collections of Evergreens. The beſt method of increaſing this, is by budding it on any of the plain kinds.

The Bay tree delights moſt in a warm, dry, ſandy, or gravelly ſoil, where it will grow to the height of between thirty and forty feet; but to preſerve its fine verdure, it ſhould be planted in ſituations defended from the deſtructive north and eaſt winds, to which if much expoſed, it will ſometimes ſuffer in a very ſevere winter, but generally recovers in ſummer, even after appearing quite dead. This plant ſhould not have a branch taken from it but in the ſpring of the year, as unſkilful, untimely, and late cutting it, has deſtroyed great numbers that otherwiſe would have defied the ſevereſt winters, many examples of which I have ſeen.

The ſhade and odour of the Bay has in all ages been eſteemed ſalubrious to the human body; and its aromatic emiſſions were in the greateſt reputation with the phyſicians of old, on account of their peculiar property of clearing the air, and reſiſting contagion; alſo, for the virtue attributed to it of reſiſting lightning: For we read, that the Emperor *Tiberius*, who was much afraid of it, uſed to creep under his bed, and ſhade his head with its boughs. Many other phyſical virtues are attributed to its leaves, berries, *&c.* but a relation of them is not in my province, further than to diſplay it as a plant of elegance and beauty, and that yields a moſt refreſhing and healthful perfume to all around it; therefore, I think it cannot be too much encouraged in our clime, where few (if any) of the large-growing plants, have theſe agreeable effects in ſo high a degree.

CHAPTER XXXVI.

THE *ARBUTUS*, OR STRAWBERRY TREE.

A Deſcription of its Flower and Seed.

The flower hath a ſmall, obtuſe, permanent empalement, which is cut into five parts, upon which the germin ſits. The flower is of one leaf, ſhaped like a pitcher, and divided into five parts at the brim, which turn backward. It hath ten ſhort ſtamina, which are joined at the bottom to the flower leaf; theſe are crowned with bifid ſummits. At the bottom of the flower is ſituated the globular germin, ſupporting a cylindrical ſtyle, crowned by a thick blunt ſtigma. After the flower is paſt, the germin becomes an oval or round berry, having five cells, which are filled with hard ſeeds.

The SPECIES *are:*

1. The common STRAWBERRY TREE, with round fruit.
2. The STRAWBERRY TREE, with longer flowers and egg-ſhaped fruit.
3. The ſmooth-leaved STRAWBERRY TREE.
4. The cut-leaved STRAWBERRY TREE.
5. The red-flowering STRAWBERRY TREE.
6. The STRAWBERRY TREE, with a double flower.

THE five ſorts firſt mentioned, are to be propagated either by ſeed or layers. The method by ſeed I ſhall firſt direct. Their ſeeds are commonly ripe from the middle of November until the end of December, as the ſummer and autumn have been more or leſs favourable: But one caution is neceſſary to be attended to, which is not to gather fruit indiſcriminately, but only ſuch as have fully ripened. The ripe berries are eaſily diſcovered from the unripe, by their rich ſcarlet colour, or deep brown tawny hue: Therefore, as ſoon as you diſcover them in this ſtate, examine your trees every two or three days, that the ripe fruits may be collected. The berries retain their growing quality but a very ſhort time; and the uſual practice is to ſeparate the ſeeds from the pulp, as ſoon as the berry is taken from the tree: But the contrary I would adviſe, and this from experimental knowledge; for having in my poſſeſſion a number of theſe trees in high perfection, and which annually fruited; my method was to preſerve the berry entire in dry ſand, until the ſeaſon for ſowing the ſeed, which was then readily obtained, by rubbing the berries between the hands, when the ſeed will readily ſeparate from the pulp, and may be ſown though mixed with the ſand.

About the middle of March, prepare a moderate hot-bed of tanners bark; and if the quantity you intend to raiſe be large, lay on ſix inches deep of the fineſt rich looſe mould, and ſow the ſeed on it, covering them not more than to the depth of the ſixth part of an inch; but if your quantity is ſmall, you may ſow them in pots, and plunge them up to the rim in the tan. In five or ſix weeks the plants will begin to appear above ground, when they muſt be frequently but very lightly ſprinkled with water, from a ſmall watering-pot with a fine roſe; for, being then very tender, if the water is careleſsly daſhed upon them, many will be deſtroyed. Let the bed be ſhaded with mats during the heat of the day; and when the plants have been a month above ground, they may receive the evening dews, and gentle ſhowers, more and more as they advance in ſtrength, until about the beginning of Auguſt, when, having been well managed, the glaſſes ought to be taken off, that the plants may enjoy all the heavenly influence of the vegetative powers in mild weather; but as ſoon as winter approaches, it will be neceſſary to have the glaſſes at hand, to be replaced in ſevere weather, but attentively admitting the open air to them when otherwiſe.

About the beginning of April, in the ſucceeding ſpring, prepare another hot-bed, which need only to be arched over with hoops, and covered with mats; raiſe the ſeedlings (which, if regular care has been taken, ought to be ſix or ſeven inches high) with a trowel, with all the earth that can be preſerved to their roots, and put them into penny-pots, filled with ſuch a ſoil as they were in before; plunge the pots to their rims into the hot-bed immediately on removal; water them, and continue conſtantly to do ſo gently as you ſee the ſurface becomes dry, in which ſtate they are to remain until the beginning of Auguſt; to be gradually hardened, by expoſing them to the open air in the preceding month in calm moiſt weather. At this time take them out of the bark, and place them in any warm ſpot, under the protection of hedges, until October, when they may be expoſed to the winter ſun in any ſituation moſt convenient, where a mat can be thrown over them during a ſevere ſtorm. The following ſpring, take all the mould (now exhauſted) from the ſurface, till you approach the roots, and fill the pots again with rich earth; remove them to a ſhady border until autumn, watering them in dry weather every ſecond or at moſt third evening, and then expoſe them again under a wall or hedge to the winter ſun.

Having now ſtood two ſeaſons in the pots, let them be ſhaken cautiouſly out with all their balls of earth, which may be eaſily done, as by this time they will be well rooted; pick away as much earth as you can from the outer part of the ball, without breaking or diſturbing the roots, and cut off with a very ſharp knife ſuch parts as may from confinement be mouldy or muſty; plunge them in a pap of water and earth for an hour, and then place them in two-penny pots, where they may continue two or three years, as your occaſions may require; but keep them the firſt ſeaſon under a ſhade and in ſhelter, and water them regularly and plentifully in dry weather, after which they will require no extraordinary protection, or further trouble, than watering, with other potted plants, as the ſeaſon requires; only obſerve, every ſpring, to take away all the earth that will come from the ſurface of the pots, and replace it with that which is freſh and rich.

Theſe plants being now ſtrong and hardy, may be removed to the places of their abode for good, which ought to be either by nature or art, a generous dry ſoil, and under the covert of other trees, but at a proper diſtance; for though I never knew any ſtrong plants of the *Arbutus* killed in a good ſoil and ſituation, except early in life, in the year 1740, yet, as I ſhould not chooſe running the ſmalleſt riſque of loſing whole plantations of ſo lovely a tree, and waiting ten or twelve years to ſee it again in any degree of perfection, I would warmly adviſe, that every nurſeryman, at leaſt ſuch who have the advantage of protection, to keep a large ſtore of well-grown plants, from three to ſix or eight feet high, in pots; leaſt ſome fatal ſtorm ſhould again rob them of thoſe in the open ground, as they would in ſome meaſure repair that misfortune.

The reaſon for directing theſe plants to be kept ſo long in pots, is, that their roots are naturally looſe and ſtraggling, with very few fibres, on which account great numbers of them conſtantly fail when removed to the open ground; but being contracted in their bounds, and aſſiſted by the heat of the bark, their diſpoſitions are changed, and they produce roots and fibres in great abundance, which encourages their future plantation.

It muſt alſo be obſerved, that this tree is not fond of being much pruned at removal, which muſt therefore be performed either a year before or after that operation.

The ſort with double flowers is more dwarfiſh and tender than the other kinds: It does not readily ſucceed either by budding or common grafting, but may be propagated by inarching on any of the other ſorts, which ought to be a free-growing healthful ſtock, otherwiſe they will not unite well, or be long-lived.

The *Arbutus* is certainly amongſt the moſt elegant and beautiful plants our country produces in a vigorous ſtate; to a perſon fond of Gardening, and who paſſes the winter in the country, I cannot think any tree more worthy a careful culture in ſo cold and inhoſpitable a climate as Great-Britain ſometimes is in the winter months. To come in from the open fields, or even from a plantation of other trees, to a grove of theſe (protected from ſtorms), their leaves ſhining with the moſt chearful verdure, their bloſſoms ſmiling as in ſpring, and their boughs loaded with the richeſt ſcarlet-coloured fruit, muſt inſpire any one capable of being affected by the beauties of nature, with the moſt lively and agreeable ideas.

Theſe trees will not ſucceed in a moiſt, heavy clay land; they will grow tolerably well in a thin and ſandy ſoil, though not rich, but they moſt affect that which is deep, loamy, and generous. They will riſe with us to above thirty feet high, in a favourable ſituation, ſheltered at ſome diſtance by other trees.

CHAPTER XXXVII.

THORNS.

Their Culture from the Seed, till they arrive to the ſize of becoming Fencible Hedges at tranſplanting.

A Deſcription of its Flower and Seed.

The empalement of the flower is permanent, of one leaf, cut into five ſpreading concave ſegments. The flower is compoſed of five roundiſh concave petals, which are inſerted in the empalement. The number of ſtamina are different in the ſeveral ſpecies, from ten to twelve or more; theſe are alſo inſerted in the empalements, and are terminated by ſingle ſummits. The germin is ſituated under the flower, and ſupports an uncertain number of ſtyles from three to five, which are crowned by headed ſtigmas. The germin afterward becomes a roundiſh or oval berry, carrying the empalement on its top, and incloſing four or five hard ſeeds.

The Species *are:*

1. The common Hawthorn.
2. The double flowering Hawthorn.
3. The Glaſtenbury Thorn.
4. The Cockſpur, or Virginian Hawthorn.
5. The Virginian Hawthorn, with long ſtrong thorns.
6. The Virginian Hawthorn, with a plum leaf, and black fruit.
7. The common Hawthorn, with white fruit.

8. The American **Hawthorn**, with yellow egg-ſhaped fruit.
9. The American **Hawthorn**, with yellow round fruit.
10. The Maple-leaved **Hawthorn**.
11. The Pyracantha-leaved **Thorn**.
12. The Cockſpur **Haw** without Thorns.
13. The narrow-leaved **Hawthorn**.
14. The Gooſeberry-leaved **Thorn**, with yellow fruit.
15. The common Nottingham **Medlar**.
16. The large Dutch **Medlar**.
17. The Neapolitan **Medlar**.
18. The Virginian **Medlar**, with ſhining leaves.
19. The Dwarf **Medlar**, with red fruit.
20. The Dwarf **Medlar**, with black fruit.
21. The large red Virginian **Azerole**.
22. The **Azerole** with yellow fruit.
23. The **Pyracantha**, or **Evergreen Thorn**.

THE uſual method of propagating the common white Thorn, with which I ſhall begin, is ſo univerſally known, as to render it unneceſſary to be related here; and the more ſo, as it is very faulty, and will admit of as many improvements. The plants, from the ſeed-bed, are uſually ſold at ſo low a rate, that the more ſkilful nurſerymen cannot afford what they raiſe at double the price. Upon this account they are generally ſown extravagantly thick in order to make ſome profit of them, and not any thing more common than to hear nurſerymen exulting in their knowledge and ſucceſs, by having more plants on the ſame quantity of ground than their neighbours, unmindful that they are boaſting to their ſhame, as the plants are of little value, and that an experienced and judicious planter would not accept of them as a preſent, knowing them unworthy his attention. But as the nobleſt and moſt uſeful improvements in agriculture, in a great meaſure, depend on the beſt methods of cultivating this common hardy plant, I ſhall treat it with more diſtinction, and order for its food much better fare than has been uſually given it. The practice I ſhall here direct, will not perhaps ſuit the nurſeryman I have been juſt ſpeaking of, but ſuch as are of liberal principles, may be encouraged to purſue it, as well as the private gentleman, engaged in the improvement of his eſtate, or domaine; which they will no ſooner do, than they will diſcover its value in raiſing the ſtouteſt, hardieſt, and moſt laſting Thorn hedges.

The berries, which are moſt commonly gathered too ſoon, ſhould remain on the trees until the end of October, when they will be of a blackiſh colour, and their fleſh in a decaying ſtate. They are uſually kept in ſacks after gathering, and buried in heaps on the gardener's receiving them: But this is exceedingly wrong, as it occaſions a fermentation, which effects the ſeed, owing to their outer coat heating by putrefaction, this deprives many of the kernels of their vegetative power, and has occaſioned the loſs of numbers of crops, without the owners being able to aſſign any cauſe. Let your Haws as ſoon as gathered, be ſpread on an airy floor for five or ſix weeks, until the ſeed are become dry and firm, when they are to be caſt into tubs of water, and entirely diveſted of their pulp, by rubbing them between the hands with a little ſand; which as ſoon as done, ſpread them again on the loft for three or four days, until quite dry, and mix them thoroughly with ſome fine looſe ſandy mould, in quantity not leſs than the bulk of the ſeed, and lay them in an heap againſt a ſouth wall, covering them over three or four inches deep, with ſoil of the ſame quality, as that with which they are mixed; and in this ſituation let them continue until the ſecond ſpring, as the ſeed, though ſown, will not appear the firſt year.

In order that the berries may be equally mixed with the ſoil, it will be neceſſary to turn over the heaps once in two months, blending the covering in the winter months. It is owing to the neglect of not mixing the ſeeds properly, and diveſting them of their pulp, that we ſo ſeldom ſee more than one half of the ſeed appear the ſeaſon of ſowing, but continue in the ground another year; and then, if the former year's plants are not taken up, which is ſeldom done, the remainder, by coming up under their ſhade, are ſtarved, and good for little. But I ſhall now proceed to lay before you ſuch a practice (having attended to what has been already directed) as will prevent theſe unlucky circumſtances.

The berries of the Thorn begin to vegetate with the earlieſt plants, and, in the natural ſeaſon of their growth, will ſpring if kept in any conſiderable quantity together, without the mixture of the ſand or light earth; hence it becomes indiſpenſibly neceſſary, to be prepared to ſow them, the firſt dry weather in February. The ſeaſon being come, ſeparate the berries from the looſe ſoil or ſand with which they were mixed, with a wire ſieve, in order that you may ſow the ſeed in an equal manner. The ground ought to be of a good natural quality, dry, and not lately acquainted with dung, which, unrotted, has very malignant effects on many plants, and on none more than the Thorn; the ſoil being good freſh land and well prepared, divide it into beds three and a half feet broad, with alleys of eighteen inches between them; take off a little of the ſurface of the beds to be laid in the alleys, as is practiſed for ſmall kitchen-garden ſeeds; ſow the ſeed with great care, ſo that they may not riſe in cluſters, and that the plants, may not be nearer than an inch to each other; let the ſeed be well preſſed into the earth with the back of a ſpade, drawing over them the ſoil you had laid in the allays, with ſuch an addition as will cover the ſeed to the depth of half an inch; for no plant is more delicate, when riſing, than the Thorn, or more readily ſmothered by too deep a covering.

Thus managed, the Thorns will all appear the ſeaſon of ſowing, which according to the old practice, will be making a ſaving of one half of the berries, and procuring an equal crop of ſtrong plants.

The ſucceeding ſpring, draw out all the largeſt plants where too thick; ſhorten their roots, cut off ſo much of their tops as to leave them about two inches above ground when planted, and lay them (but beware of dibbling) in lines a foot aſunder, and four inches diſtant in the line, to remain two years.

Such as would chooſe to follow the old practice, I muſt perſuade to ſow the Haws much thinner; ſenſible that I ſhall not be able to prevail on many gardeners at once, to relinquiſh the prejudice that cuſtom has confirmed, yet ſome I have the happineſs to know of more liberal ſentiments, and who want no more than a reaſonable hint, to try any experiment that may tend to promote by a better culture, the growth of our hedges and Foreſt-trees:

To theſe therefore, and to ſuch as are not ſtraitened in ground, I, from the moſt ſubſtantial reaſons, adviſe the following practice:

Let the berries be ſown thin, or rather drop them into drills, made either with your fingers, or with a very ſmall hoe, at eight inches diſtance the two firſt drills, and double that diſtance between them and every following two, being careful they are no deeper covered, than directed when ſown in beds; let the ground be kept very clean and mellow about them, till the ſucceeding ſpring, when you muſt draw up ſuch as are too thick, as formerly directed; after this, cut the remainder with a ſpade, about five or ſix inches below the ſurface, to remain another year, firſt pointing over the ground between the lines.

That this practice is no vague opinion, but much preferable to crowding them in beds, carries the cleareſt evidence, to every man of the leaſt attention, who does not chooſe to ſhut his eyes, and who will be at the pains to examine the plants on the edges of beds next the alleys, where he will univerſally find them of double the ſize, and more abundant in roots, than in the middle of the beds.

Notwithſtanding the preceding directions, both for preparing and ſowing the berries, are the beſt I know of to procure ſtrong well-grown plants, yet, when numbers only are the object, without any regard to the time ſaved, or their future quality; I am ſenſible greater numbers may be procured with leſs trouble and expence, by ſowing the ſeed immediately as ſoon as ripe, or the following ſpring, which is the beſt ſeaſon, as, then the ſurface of the ground will be but one winter battered with the ſtorms, inſtead of two. The ſeed which is not to appear until the ſecond ſeaſon, is to be covered to double the depth of the ſeed that is to appear the firſt ſeaſon. In autumn, rake from the beds all moſſy corrupted particles, and, in the following ſpring, before the vegetation is briſk, reduce the covering with a ſhort-toothed rake to half an inch. By this attention, all the ſound ſeed will come up at the ſame ſeaſon; but the plants will not be one fourth-part of the ſize, or have near ſo good roots as thoſe whoſe berries have been preſerved as directed, and ſown on freſh looſe ſoil, for their appearing the following ſeaſon. From the ſmall ſize of theſe plants, it will be neceſſary they ſhould remain in the ſeed-bed two years.

Thorns may alſo be propagated to much advantage, and two years time ſaved, by cuttings from their roots. For this purpoſe, at removing a nurſery of them, cut off all unneceſſary roots that are ſtraight and clean, of one, but not more than two years growth; let them not exceed the length of four or five inches, and, either early in October, or February, lay them in drills cut out with the ſpade, with their tops a quarter of an inch below the ſurface; let theſe drills be a foot aſunder, and the roots in them at the diſtance of three or four inches, as not a ſingle freſh and ſound root will fail, that has been planted with care and attention. If the land has been well prepared, of a good quality, and kept clean and mellow, the plants will be from eight inches to a foot high the firſt ſeaſon; and the following ſpring, having pointed over the ground between the lines, they muſt be cut with the hedge ſhears, to within two or three inches of the ſurface, when, by continuing a proper culture during the enſuing ſummer months, they will in general be eighteen inches high, and moſt abundantly rooted at two years old.

I am very far from intending to divert any one's attention from following the juſtly eſtabliſhed principles, of raiſing plants in general from their ſeed, fully ſenſible of its preference to all other practices in moſt caſes; but as there are few rules without ſome exceptions, this appears to me one; in which the ſaving of time is not a little advantageous: To which I ſhall add, that theſe plants, in place of one ſtrong perpendicular ſhoot, (which is commonly the caſe of young vigorous ſeedlings), puſh out a number of ſhoots very much equal in ſtrength, and continue to grow in that manner, not ſuffering a few branches to run away with the ſap which ought to nouriſh many, and that too in much the ſame proportion; hence, from experience, I muſt affirm, that for the moſt equal, cloſe, and impenetrable hedges, plants raiſed from young and tender roots are the beſt; but for ſingle trees, meant to grow in the moſt comely form, and aſpire to the greateſt height, thoſe propagated from ſeed are to be prefered.

All the different plants are now to be treated in the ſame manner, and in October ſhould be planted out in lines, at leaſt eighteen inches aſunder, and ſix inches in the line, their roots having been ſhortened, and their tops cut down, ſo as to ſtand four or five inches above the ſurface when planted. In this nurſery they ſhould remain no longer than two years, and the ground muſt be dug both in autumn and ſpring between the lines, as it will occaſion their rooting abundantly, as well as promote vigorous clean ſhoots, that, the year after when planted in this nurſery, may again cut down to an inch or two above the former cutting.

In autumn, remove them to another quarter, and plant them in lines four feet aſunder and two feet diſtant in the line: Let them now be cut to the height of a foot or fourteen inches, and, about the end of June, clip them ſtraight in the ſides and thin in the tops. Having ſtood here a year longer, cut them again to the height of two, or two and a half feet, as, from a favourable or bad ſeaſon, their ſhoots have been more or leſs vigorous, clipping them as you did before. The ground being of a good quality, and properly cultivated, in the third ſeaſon, they will admit of being cut at three and a half feet high about mid-ſummer, and raiſed the following autumn, when they will make handſome hedges about four feet high, that will at once afford both pleaſure and ſhelter.

But to bring them to the higheſt degree of perfection, let them be once more removed with balls of earth, which they will naturally have, if carefully and ſkilfully raiſed. For this purpoſe, let a trench on each ſide be dug up conſiderably deeper than the ſpreading roots, then with a ſharp hedge-bill or knife, cut acroſs all the downright ſhoots, which, from the former tranſplantations and proper dreſſings, will not be many or ſtrong; at the ſame time keeping them as ſteady as poſſible, to preſerve the balls of earth to their roots. This being done, lay them gently down on one ſide, and with a ſharp knife ſmooth the extremities of their roots, equally ſhortening thoſe that are downright or too ſpreading; having previouſly prepared upright trenches to receive them at eight, or where land can be ſpared, ten feet aſunder; in theſe trenches let them be placed the ſame depth they formerly ſtood, and at four feet diſtance in the line, giving them an abundant watering; cultivate the ground about them, which may be cropped with various kitchen herbs, and here let them remain three years, clipping, and in all ſhapes dreſſing them to their proper form, as if planted out for good.

Early in October, while the ground is warm, begin planting your hedges. To effect this properly, make a trench as formerly, but both wider and deeper than to contain the roots; for ſhould the ground be poor and thin, it will be neceſſary to lay a ſtratum of middling freſh earth at the bottom of the trench, ſix or eight inches deep, or, where your ſituation will admit, a greater abundance will be the better; and having levelled the trench to a depth ſuitable to receive the plants, let the earth ſettle for ſome days, that it may not afterwards ſubſide in any material degree. In the mean time, before you raiſe the hedges you intend to remove, go over them with a light ſharp hedge-bill, and cut out all ſuch branches, (particularly towards the top,) as are too thick and ſtand too near each other; cut them to your intended height, not exceeding ſix feet high; then raiſe, and plant them as directed for the former removal, at ſuch diſtances as they may join cloſe together; let them have a plentiful watering at planting, and repeat it three or four times during a dry ſpring and the ſummer months, when, after being eſtabliſhed one year, they will reſiſt the rudeſt attempts of the wildeſt animals in this country.

The wind is the great enemy of new-planted Thorn-hedges of any conſiderable ſize; but, by the judicious performance of what has been directed, from which the roots will be ſo encreaſed as fully to balance the heads, ſo that the trees will be enabled to withſtand the winter ſtorms. Every gardener of common underſtanding, in order to ſave ſeveral years growth, very judiciouſly enquires after old hedges, (I mean ſuch as are not, from age or other circumſtances, in a decaying ſtate), in order to cut them down preparative to their being moved to a ſituation he deſires. I need not mention, that ſuch grow more in one year, than a young Thorn in three or four; and if they grow freely without any preceding culture, when cut down, and removed at the ſame time, (which by the bye muſt be no ſmall violence done them at an advanced age) I am at a loſs to diſcover what reaſonable objection can be offered againſt the proceſs I have juſt directed, as the plants by it are cultivated in ſuch a manner, as to give them ten times the number of roots they poſſibly can have in their wild ſtate, and brought to ſuch a proportion of body as their roots will keep ſufficiently ſteady; I ſay, when theſe circumſtances are conſidered, what doubt can ariſe, but that Thorn-hedges immediately fenſible will ſucceed? Strange, that in a country which boaſts of abounding with the beſt gardeners in Europe, ſuch ſimple eſſays as theſe ſhould not be frequently made for the benefit of ſuch as are willing to beſtow a little more than common expence, and chooſe (if I may be allowed the expreſſion) to anticipate time, and accelerate an improvement that the poſſeſſor has a right to attempt, both from his fortune and ſpirit of improvement.

I cannot quit this ſubject, without pointing out an error almoſt univerſally practiſed in clipping our hedges thick, and broader at top than bottom. This has rendered of little benefit the greateſt part of the fences within my knowledge, which properly trained, would have been the higheſt ornament, and moſt ſolid improvement our fields are capable of receiving. How a practice ſo glaringly oppoſite to nature, and even to common ſenſe, ſhould be adopted in a country devoted both to the ſtudy and practice of planting, is ſtrange to imagine! but unluckily it requires no proof, for ſuch is the caſe. The under parts of the hedges ſo trained, are quite deprived of the benefit of the rains and dews, theſe indiſpenſible ſupports of their ſtrength and verdure, and are in ſome degree ſmothered, which occaſions the weakeſt branches annually to periſh, by this the bottom becomes quite naked, which no future care or induſtry can repair, but by cutting them down, or at leaſt reducing their height, and pruning them cloſe to their naked trunks. This, tho' a certain, is yet a tedious cure; and to expoſe the fields to their original cold and defenceleſs ſtate, after beſtowing on the hedges a care, which if it had been properly applied, would have made them continue beautiful and fencible for ages: Therefore to avoid this danger, let your hedges be gradually clipped taper from the bottom, in form of a razor, until they arrive to their intended height; this can be eaſily executed by a man with ſpring ſhears, to the height of fifteen feet, without any apparatus to raiſe him from the ground. It has been a matter diſputed whether it be neceſſary to continue to clip hedges when they are old, where ornament is not the immediate object, and that the hedges are only boundaries or diviſions of corn or graſs lands. However this cannot be diſputed, that wherever warmth is neceſſary for the protection of land or crops, it cannot be more eaſily or certainly proved, than by exerciſing the ſhears, which muſt be left to every one to judge how far the expence may ſuit his convenience, which perhaps may not be ſo great as imagined, when properly put into execution and purſued. The Thorn tree, when not under any diſcipline, grows in a looſe ragged manner, with heavy and ſpreading tops, which deſtroy many of the under branches, for want of air and moiſture, and when planted in looſe or wet lands, the winter winds diſplace and disfigure them extremely; ſo that, when all circumſtances conſidered, I could never diſcover any well-founded argument againſt clipping them, ſave the expence, which, if annually done after a proper manner, in the months of July and Auguſt, will be ſmall in proportion to the pleaſure and benefit that will follow from it.

Digging and keeping clean the borders on each ſide of your hedges, at leaſt for a few years, will alſo be well-beſtowed labour, as it will much accelerate their growth, and contribute to their ſpeedily thickening at bottom.

Many improvements may be added to the common practice, in the diſpoſition and manner of planting our young Thorn hedges. Some lands indeed are ſo thin and meagre as not to produce tolerable fences without a greater depth of ſoil, but hardly any are ſo bad (very wet grounds excepted) as will not nouriſh Thorns in ſuch a degree as to become fencible, by an addition of ſoil (though of the ſame quality)

quality,) when previouſly well blended together, and expoſed to the ſummer's ſun and winter's froſt, for a ſeaſon.

Therefore, in order to incloſe the ground of a dry thin ſoil, mark out the diſtance of four feet for the breadth of the ditch at the ſurface, then raiſe the ſods ſixteen inches ſquare, and lay them with the graſs ſide downwards, at eight inches diſtance from the edge of the gripe, one row of ſods made three deep employs the ſurface taken up, then you are to lay a line of Sweet Briars three or four years old, (that have been tranſplanted,) from a foot to eighteen inches aſunder, to be covered with the beſt earth, laying the remainder of what is good, immediately beyond their roots. For the finiſhing of your bank, you muſt procure ſods from the adjacent ground, as it is to be raiſed eighteen inches higher, then lay another line of Sweet Briars, placing them ſo that every plant may fall over the diſtance kept in the former line of plants. Theſe being alſo covered as the firſt line, you are now to dig the gripe of your ditch to the depth of four feet, and as wide at bottom as to admit a man readily to heave the ſoil over the bank: Proceed then to complete the bank, (which, for an immediate outward fence, muſt be four feet high,) laying the laſt row of ſods with the graſs ſide uppermoſt, as it will ſooneſt make them unite, and form one conſolidated ſurface; the ſolids are not to batter more than ſix or eight inches from the baſe to the top. The common practice is to make the banks ſlope in the ſame proportion as the ſides of the ditches; and the argument for it is, that they ſtand the weather better. But if the ſods are carefully laid, and well preſſed together with the back of a ſpade, there is not the ſmalleſt danger of their failing at the height I have directed them to be made, and therefore I would adviſe them to be laid within ſix or eight inches of being perpendicular: My reaſon for this is, that I intend the Sweet Briars planted in the face of the bank ſhall hang over the ſide of the ditch under it, to protect it from being waſhed down by violent rains. It will alſo be a better defence againſt cattle, who are often invited to make treſpaſſes from the eaſy aſſent offered them by otherwiſe making the banks; but from this poſition they have no footing, and when the Sweet Briars have ſtood two years, cattle in the gripe of the ditch will not be able to raiſe their heads without being oppoſed by them, which they will not attempt a ſecond time. A ſheep-park thus incloſed, will, in three or four years, confine theſe animals no leſs effectually than the higheſt wall, as they, and indeed horſes as well as cows, cannot bear the touch of them. Perſons even in ordinary circumſtances, can think much of the expence of the Sweet Briars, as there is not any plant more eaſily or expeditiouſly raiſed; or may be had at a cheaper rate. In order to propagate them by ſeed, let hips be gathered in autumn, to be kept in ſand during the winter; and in ſpring rub out the ſeed to be ſown in drills upon low banks; they ſhoot to ſuch a conſiderable height, that in two years they become a very conſiderable fence, and will even keep out ſheep. This Briar abounds with ſo great a number of penetrating roots and fibres, as ſoon to render any bank they are placed on as impenetrable as a wall; and there is no plant yet diſcovered, ſo proper for filling up the gaps of old hedges of all kinds, or where plants of the ſame ſort of the hedges will not ſucceed. But I ſhall now proceed to the conſtructing the inner ſide of the bank.

Having furniſhed this with the beſt earth you can procure, ſlope it gradually to the height of three feet from the baſe, ſo that the rains may not waſh it down, and as the bank is to be four feet high, the additional foot is to be made good with the beſt ſoil you can procure, as in it the thorns are to be planted, which is to be finiſhed in a hollow ſurface of two feet, the better to retain the moiſture to feed the new planted Thorns. On this plant your Thorns, and in nearneſs proportioned to the ſize of the plants; for the common run of Thorns of three or four years old, ſix inches diſtance is the general rule, but for ſtout plants that have been twice removed, and conſequently have abundance of roots, a foot will not be more than a ſufficient diſtance. Theſe Thorns muſt not be planted upright, but in ſuch an horizontal line, that the top of one may extend as far, and be juſt over the root of the other; and this in the length of the bank from end to end, the plants inclining one over the other. This method of planting, will make them buſh from the bottom like a fan, and in two years, by keeping them as has been directed, they will be ſo cloſe that a ſmall bird cannot get through them.

The

The EXPLANATION *of the* PLATE.

FIG. I. *A tranſverſe ſection of the ditch and gripe.*

a. b. c. d. Section of the gripe, four feet at top from a. to b. and of the ſame depth.

c. d. The width of the bottom of the gripe, which muſt be ſufficient to admit a man to ſtand in, to heave the earth over the bank.

b. e. A ſpace of eight inches between the edge of the gripe, and the foundation of the bank.

o. o. o. Three rows of ſods dug from the ſurface of the gripe, laid with their graſs ſide downward; the ſhaded part immediately over them, repreſents the good ſoil for the Sweet Briars to grow in.

n. n. n. n. The ſecond rows of ſods, ſufficient to raiſe the face of the bank eighteen inches higher; the ſhaded part is the good ſoil for the ſecond row of Sweet Briars, over which are more ſods (marked i.) ſo as to raiſe the face of the bank (e. s.) four feet, which muſt batter or fall in eight inches.

s. p. The top of the bank a little hollowed, ſo as to retain the moiſture, and of ſuch a breadth, as to leave the ſpace (v. p.) between

Page 258.

Fig. I.

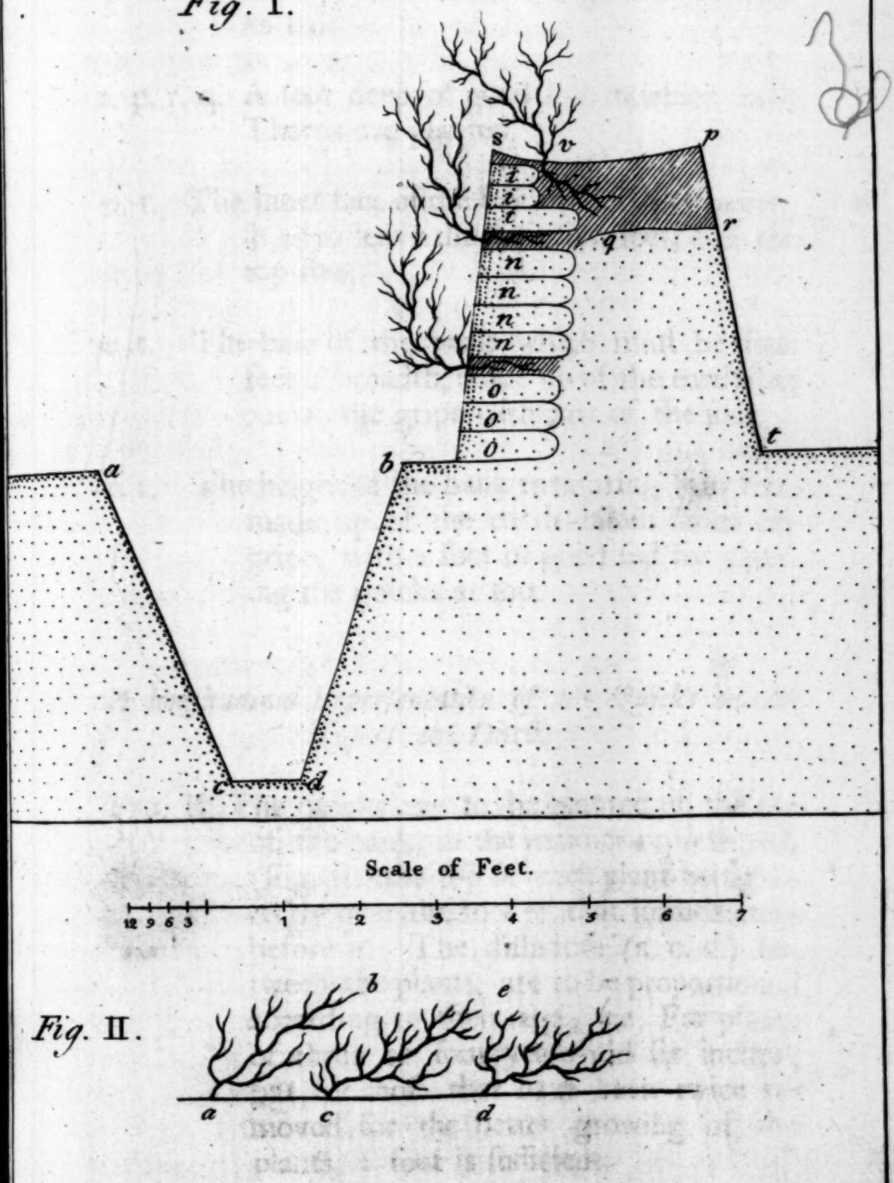

Fig. II.

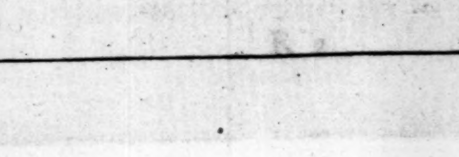

Fig. I.

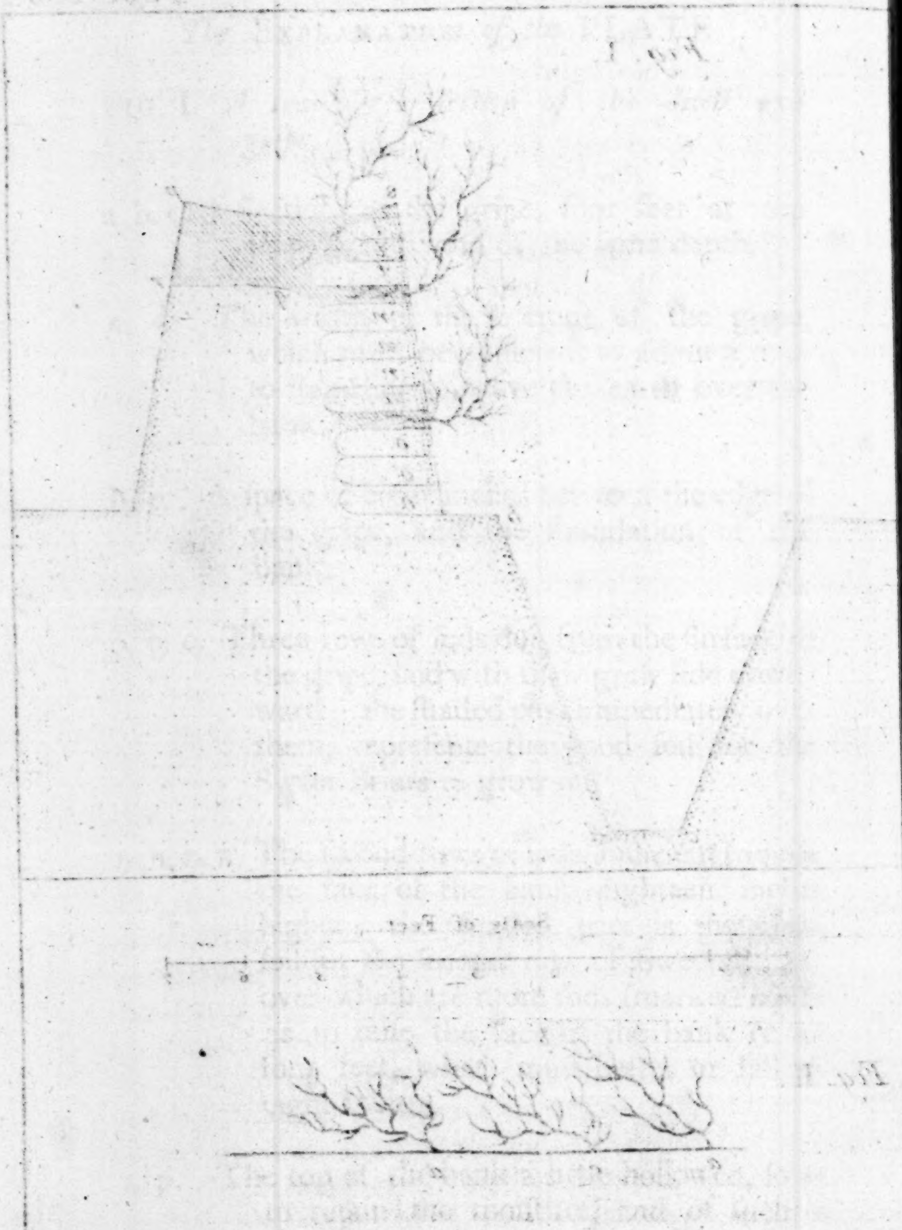

Fig. II.

tween the row of Thorns (planted on the top) and the inner edge one foot and an half.

s. p. r. q. A foot deep of good ſoil, in which theſe Thorns are planted.

p. t. The inner face of the bank which is to batter, ſo as to leave the baſe four feet, and the top two.

e. t. The baſe of the bank which muſt be four feet in breadth, made up of the earth dug out of the gripe with part of the ſods.

r. t. The height of the bank meaſuring four feet, made up of the earth taken from the gripe, with a foot of good ſoil for planting the quicks at top.

A longitudinal Repreſentation of the Quicks on the Top of the Ditch.

Fig. II. The quicks are to be planted on the top of the bank, in the manner repreſented, (Fig. II.) the top of each plant being directly over the root of that immediately before it. The diſtances (a. c. d.) between the plants, are to be proportioned according to their age; viz. For plants of three or four years old ſix inches; but for thoſe that have been twice removed for the better growing of the plants, a foot is ſufficient.

The different ſizes of Thorns, to procure fencible hedges ſooner or later, has already been mentioned; and it muſt be left to every improver's judgment, what money or labour he chuſes to beſtow: Therefore I ſhall only add, that an old Thorn is hardier than a young one, and will ſucceed in coarſe obſtinate grounds, where the other will periſh; the difference of expence between thoſe of three and ſix years old is nothing, for allowing the oldeſt to be double the price, they will plant double the ſpace. In unkindly ſoils, what I have here ſaid, I know experimentally to anſwer; but it may be obſerved, that ſmall Thorns planted in a good ſoil, at the ſame diſtance they ought to ſtand when older, will in time make equally good hedges. This I muſt grant; but the difference of expence can bear no proportion, to the advantage of having a good fence three or four years ſooner, and ſaving in that time the expence of culture, which for ſmall plants is much greater than when large; ſo that I cannot think any circumſtance ſhould prevail with the gentleman of ability, to make choice of any but the well grown plants for his work.

The ſame rules directed for training Thorns in the nurſery, intended to form immediately fencible hedges, are to be obſerved in reſpect to ſuch plants, as are deſigned for improvements or the field.

It may be neceſſary here, to offer ſome reaſons for my making choice of Sweet Briar, for the face of the ditch in preference to Thorns, which are uſually made uſe of. The beſt I can offer, is, the hardineſs of the plant, which will ſucceed in many ſoils and ſituations where Thorns will not; and what is more material in the preſent caſe, is, that being a dwarfiſh light ſhrub, they never arrive to ſuch a ſize or weight, as to be affected by the winds in any degree, that will in the leaſt looſen or ſhake the banks, which is too frequently the caſe with Thorns.

Of all the devices yet fallen on for planting hedges, none are ſo natural, and effectual for the inward diviſions of dry ground, as that of raiſing them on the ſurface of a well-dug, or trenched border, thickened where the ſoil is thin, or mellowed by labour and warm looſe earth, where cold and ſtiff. Next to that, both in point of beauty and utility, is on the top of a ſunk fence built with ſtone; but even there, though for ſeveral years they will grow about as faſt as on a level, yet, when the roots approach the wall, they are of conſequence retarded in their progreſs on that ſide, and will not afterwards grow with the ſame luxuriance as on the ſurface unconfined on both ſides.

In wet lands, not only ditches, but theſe double and deeper than what have been directed, are indiſpenſibly neceſſary, as the firſt capital improvement that can be made, which ought to be ſo diſpoſed as to receive ſmall covered drains from the wet quarters of the adjacent fields, at the neareſt diſtances may be, to convey the whole water away; and which, in many ſituations, may ſave a great expence, by ſhortening the unneceſſary diſtances of theſe drains.

To attempt general ſyſtems for the draining of grounds is quite uſeleſs and ineffectual, as it depends too much on local circumſtances. The different kinds of drains for different ſoils, accommodated to the materials thoſe ſoils produce, or that are convenient to be had, may be directed; but no language can convey ſuch rules as will inſtruct the unexperienced in the knowledge of an univerſal ſyſtem, as the ſame plan will rarely anſwer any two fields of an hundred, therefore, without getting a particular plan of every ſpot, we get nothing, a general uſeful one being impracticable. Nature muſt dictate the courſes we are to follow, good ſenſe purſue thoſe dictates, and experience conduct the different manners of operation.

Where double ditches are determined on, their breadth muſt be proportioned to whatever plantation you intend them for; but in general they are made too narrow, which occaſions them to become too dry, when of courſe the plants are not properly nouriſhed. For a hedge only, the bank ought to be nine feet at bottom, and eight at top; for a hedge and one line of trees, ſixteen; that is, planting the trees at eight feet from the hedge, and four from the edge of the bank; and for two lines of trees, one on each ſide of the hedge, twenty-eight feet. This I think is the leaſt diſtance that can be given; but where ſtripes of land are wanted, either for wood, or the improvement of the climate by ſhelter, the plantation ought to be broader or narrower, as the incloſures they are to ſurround are greater or leſs.

Let the quality of the ſoil be conſidered in the conſtruction of ditches, and more baſe given to the perpendicular height, where the land is looſe and ſandy, or ſpungy and moſſy, than where well tempered and ſolid, or obſtinate clay and till. A ditch, on ſoils of the latter quality, four feet wide, will admit of being of the ſame depth; of the former, three feet depth to the ſame breadth, will be in general as much as it will bear, and ſo in proportion as the ditches are broader or narrower. In ſpouty and moſſy ſoils the Sweet Briars will be doubly uſeful, as they will there ſucceed better than moſt other plants, and conſolidate the banks ſooner and more effectually.

The fences in Windſor Foreſt, for confining the deer, and preventing their depredations in the adjoining fields and plantations, are held by many improvers as the beſt model for fences in general. But I am ſorry I cannot fall in with their ſentiments; their nature and conſtruction I am well acquainted with, having lived a conſiderable time in that neighbourhood: They are made of double ditches, the contents of which form a bank between them; on the top of this bank, is planted a hedge-row either of white Thorn, or Crab, Maple, Hazel, Elder, Elm, or Oak trees; a little above the ditches, a dead hedge is erected, by driving ſtakes into the ground, to be interwoven with black and white Thorns, Brambles, Briars, or whatever bruſh-wood can be moſt conveniently procured, to protect the plants till they become ſenſible. That theſe kinds of bulwarks may frighten deer, or even lions, &c. from approaching them, I cannot doubt, as they preſent a moſt unnatural, gloomy, and horrid aſpect, and which, in my opinion, highly deforms a ſpot, otherwiſe abounding with the ſweeteſt, richeſt, and moſt magnificent objects I ever beheld. One great argument uſed in defence of theſe fences, is, the profitable returns they yield for fuel, in a country where they have no coal nearer than London; but I ſhould think very little ingenuity might contrive to raiſe more and better fuel on the ſame quantity of ground: In ſhort, I cannot think them calculated for any thing, but a ſavage uncultivated country, where there is danger of being invaded by wild beaſts, whoſe incurſions they might probably repel.

Where hedges of uncommon ſtrength are required, I know nothing ſo effectual as double lines, planted in the triangular manner; ſo that the plants in one line may be directly oppoſite to the interſtices of the other, whence animals attempting to force their heads through any weak part of one line, are met in the noſe, and repulſed by the oppoſite plant. Theſe trees too, growing in concert, afford a mutual aid by ſheltering each other, and will for ſeveral years grow faſter than a ſingle line.

Standards of all kinds are highly deſtructive in hedges, by hanging over, ſhade and ſmother the plants below them, and in all reſpects rob them of much nouriſhment.

Hedges that have grown any conſiderable time wild and uncultivated, muſt neceſſarily become ragged and open. To remedy this, the common way is to plaſh them; and where they are not more than ten or twelve years growth, I have known them to become tolerable fences, when not too much wounded, (the common error) but when done with ſkill and attention, and afterwards regularly clipped; but if they are not taken about that age, the ſeverity of the wounds, neceſſary to make them comply to their proper ſtations, are ſo great, that in a few years many of them die, and becoming full of gaps, are more unſightly, and leſs fencible than ever; hence the advantage is of ſhort duration, and the remedy becomes worſe than the diſeaſe. But the only method of cure I can deviſe, and which I have often ſucceſsfully practiſed for old overgrown Thorn-hedges, is to prune them cloſe to their bodies, and cut them down ſmooth, with a ſlanting cut, to the height of about four feet, ſupplying the gaps with old Hollies, or ſtrong plants of Sweet Briar, both of which ought to be diveſted of great part of their branches, which will make them puſh out moſt vigorouſly a great number of young ſhoots, reſiſt the winds, and ſooner become ſtrong equal fences.

In ſupplying theſe vacancies, however, a little extraordinary labour and attention muſt be beſtowed, in clearing away the roots of the old Thorns, and making the hole as large and as deep as the ſpaces will allow; in which, if ſome freſh ſoil is laid in the place of the exhauſted earth taken out, you enſure ſucceſs, and ſave time by having more liberal ſhoots, which will largely repay the expence.

To deſcribe the various methods that have been practiſed by incloſing grounds with hedges and ditches, would be both tedious and unneceſſary; nor would it be difficult to direct a yet greater variety of ways hitherto unpractiſed, further than for making experiments; ſo that the few rules here recommended, as they are moſt natural and ſimple, ſo I have ever found them the moſt ſucceſsful.

The following thirteen kinds of Thorns are worthy of being cultivated, in all good collections of flowering plants, where, from the beauty and fragrance of their bloſſoms in ſpring, joined to the rich glow of their fruits in autumn, they have a moſt chearful effect, properly diſpoſed in the wilderneſs, or in groves near the houſe.

They are all, except the double-bloſſomed ſort, to be propagated from ſeed, where theſe can be procured; but as ſome of them are apt to vary from the parent plant, when increaſed that way, I ſhould rather adviſe their being grafted or budded on the common kind, from hence they will not only ſooner become fruitful, but ever after continue to be ſo, wherein their greateſt beauty conſiſts.

The Medlars and Azeroles are cultivated, both for mixing with others in ornamental plantations, and for the ſake of their fruit in the kitchen garden, where they are planted in ſtandards and eſpaliers. They will ſucceed by grafting, or budding them on the common Hawthorn, but will be improved both in the ſize of the plant, and flavour of the fruit, by budding them on the Pear-ſtock. To inlarge the tree, a deep moiſt ſoil is neceſſary; but where fruit is the motive, a generous dry mould and warm ſituation is beſt.

Let the ſtocks for the Thorn, when grafted or budded, be in a free-growing vigorous ſtate, and about the bulk of one's finger, three or four feet above ground, which will be a proper height for theſe operations. The Pear-ſtocks, for the Medlars and Azeroles, muſt be proportioned to the uſes you intend them: If for dwarfs, eſpaliers, or walls, graft them within three or four inches of the ground; but if for ſtandards, the ſame height as on the Thorns will be beſt, as otherwiſe (they growing in a looſe ſtraggling manner) it will be difficult to raiſe them with ſtraight clean bodies.

The Pyracantha or Evergreen Thorn is a trailing plant, and cannot be raiſed to a ſightly ſtandard, but is very proper for covering walls near the houſe, where the ſhining verdure of the leaves in winter, almoſt covered with large bunches of rich ſcarlet coloured fruit, is extremely beautiful. They are eaſily propagated from ſeed ſown in February, in the ſame manner as the common Hawthorn, but in a ſhady border, part of which will riſe the firſt, and the remainder the ſecond ſpring, and theſe make much better plants than thoſe increaſed by layers.

I have ever thought we pay too little reſpect to the common Hawthorn in our ornamental plantations, as, in the ſeaſon of its bloom, I know few trees exceed it either in beauty or fragrance; I would therefore recommend it more for the wilderneſs work, as well as ſingle plants in lawns, where a conſiderable number of them, judiciouſly interperſed with others, would highly decorate thoſe ſcenes. The Thorn, unconfined, encouraged and in its natural luxuriance of growth, becomes a ſtately tree; and the wood, which is extremely hard, and finely variegated, particularly towards the root, is not inferior to Box for many curious and uſeful purpoſes.

CHAPTER XXXVIII.

On the PROPAGATION of TREES by LAYERS.

THE manner of preparing mother plants or ſtools, from which you are to propagate trees by layers, has already been directed under the article of the Elm Tree. Theſe directions having been obſerved, and ſtrong clean ſhoots produced, early in October begin the operation, with all the hardy deciduous trees that are moſt proper to be cultivated in that way, and which are mentioned under their reſpective names. In the firſt place, cautiouſly bend down all the principal branches around the ſtool, without wounding them, if poſſible; let them be at ſuch diſtances from one another, as to admit all the ſmaller collateral ſide-branches to be laid between them, and let them be firmly pegged down in the ground with hooked ſticks, or otherwiſe, if the ſhoots are ſtrong, the preſſure of the earth alone will not prevent their ſtarting up. If the principal ſhoots have no ſide-branches fit to lay, that is, if they are not about a foot in length, let all under that be pruned cloſe away, and the main ſhoot be only laid; all the ſmall twigs from the ſide-branches muſt likewiſe be cut cloſe, or rubbed off, as the fewer ſhoots the layers produce, they will be the ſtraighter and more vigorous. But before I direct the manner of covering them, I ſhall mention the different ways neceſſary to be practiſed with the branches, in order to force them to root.

Some tie a piece of wire hard, round the twig, at that part where the roots are deſired, and prick it in ſeveral places above the wire, through the bark with an awl.

When the wood is very hard and unwilling to root, the branches are ſometimes cut by a ſlit upwards from a joint, as is practiſed in laying Pinks and Carnations, which is called by the gardeners tonguing the layers: But this ſeverity I would ſeldom chuſe to practice, as trees diſpoſed to root by layers, may be prevailed on to do ſo by gentler means, when ſkilfully applied. The plants raiſed in that manner, are a long time recovering their wounds, and are very apt to be torn aſunder when taking them from their mother plant.

Twiſting the twig at the joint where the fibres are to proceed from, is often ſucceſsful, but with ſeveral kinds of hard wood it does not anſwer; but with all the ſoft kinds it is an excellent practice.

There are other different operations performed in laying trees; but the ſpecimens given are the beſt I know of, except one, which, though very ſimple, I have ſucceſsfully practiſed during the greateſt part of my life, and that is, ſcratching off the bark where the roots are wanted to be formed, deep as the wood, to about two or three inches in length, and two thirds round in ſtout branches, and leſs in ſmaller.

Having treated the branches in one or other of the ways deſcribed, proceed to lay them in the ground, by pegging down that part where you have made an inciſion, and with both your hands preſs it into the earth, till it becomes ſharp at the joint, as from it the ſtem muſt riſe quite perpendicular; for if they are only bent in the form of a club, they will not by any future culture make ſtately or handſome trees. Let them be covered to about four inches deep, their tops cut down to two or three buds above the ſurface; obſerving, that from the extremity of the beds, they fall in gradually, ſurrounding the ſtool, hollowed within, in form of a baſon, the better to contain the rains that fall, or the water given them by hand, which in dry weather ſhould not be ſpared, as nothing will contribute more to their rooting abundantly.

It will likewiſe be proper to go over the layers about the middle or towards the end of May, to rub off all the buds and tender ſhoots except the moſt promiſing, as a great number of branches prevent the kindly effects of the rains and dews, and deprive the principal of its nouriſhment.

The autumn, as has been obſerved, is the beſt ſeaſon for laying all hardy deciduous plants; for ſuch as are delicate, the ſpring is a more promiſing ſeaſon, leſt, immediately after the neceſſary operations, a hard winter might deſtroy them: For the very ſame reaſon, I prefer laying the tender Evergreens at that time alſo, rather than the uſual ſeaſons of Auguſt and September. But for the hardy kinds, I know no other ſeaſon neceſſary to be obſerved, than that in which one can beſt ſpare time.

Though ſome little inciſion is neceſſary on the layers of moſt hard-wooded trees, yet in the Lime, and many other ſoft pliable plants, nothing more is wanting than a proper covering, and attention to the other circumſtances of general culture.

SOME
HINTS ON PLANTING.

By a PLANTER.

Printed at NEWRY, in IRELAND.

NO country would be more beautiful than *Ireland*, if its inhabitants were as fond of planting, and as careful of their trees, as the people of other countries; for ſurely we have here the ſweet interchanges of hill and dale, and the moſt beautiful pieces of water to enliven the landſcape.

Every planter ſhould encloſe the ground he intends to plant, with an impenetrable fence. The beſt of all fences is a wall built with lime and ſtone, a dry ſtone wall the worſt. A ditch fenced with ſtones, and planted with four years old white-thorn, or holly quicks, and raiſed ſo high, that neither ſheep nor horſes may get over it, is an excellent fence, and affords a moſt hoſpitable ſhelter.

In vain do we plant trees, if cattle are ſuffered to get into our young plantations, or even into our full grown woods, for though they may not bark old trees, yet they will rub againſt them, and leave an oily matter on their ſtems, which by obſtructing perſpiration ſtop all vegetation.

The planter ſhould not ſuffer rabbits to get amongſt his young trees, for they will bark every one they can get at; the moſt effectual way of deſtroying them, is to lay for them parſley poiſoned with arſenick amongſt the trees, when the ground is covered with ſnow.

Nor ſhould the planter ſuffer any rooks or magpies to ſettle amongſt his trees, for they will break off the leading ſhoots, and occaſion the trees to become forked. Where Sallows will grow, the planter ſhould ſet tall cuttings of them into the top of the ditch, net-wiſe, and they will ſoon form a ſtrong fence, and ſhelter the plantation. Should the ground be too dry for Sallows, cuttings of Elder may be uſed, and broom and furze-ſeed ſown amongſt the cuttings.

I ſhall not recommend the ſowing of acorns, or the ſeed of trees, or nuts, where they are to remain, for our ſoil is ſo much inclined to graſs, that unleſs great care is taken, conſtantly to weed the young plants, this method ſeldom anſwers; and in large plantations, it is impoſſible to do it effectually, for oaks make but very little progreſs during the firſt three years, and therefore would require much weeding, but their roots ſtrike down to a very great depth; I have meaſured the roots of four years old oaks that were above four feet long.

Another great objection to the ſowing of acorns, &c. in open ground is, that rats, mice, and other vermin will devour the greateſt part of them. I would therefore plant out three years old trees from the ſeed-bed, taking them up carefully with all their roots. Theſe I would plant almoſt horizontally, and then cut their heads cloſe to the ground.

Every planter ſhould have large nurſeries, made in the lighteſt and moſt ſandy ſoil he has, and ſo contiguous that he may immediately plant out his trees without the danger of their becoming dry in the removal, but ſhould he not have trees ſufficient he ſhould procure them from ſome nurſery in his neighbourhood, where the ſoil is like the ground he is planting; he ought not to purchaſe trees from nurſeries near great cities, as they are often raiſed on dunghills, and in an air much warmer than in the country.

The ſeed of the arbutus and other tender plants ſhould be ſown in boxes, that can be removed from place to place, filled to within eight inches of the top with Virgin Earth, then a layer of three inches of rabbit ſand or turf mould, over this lay about two inches of rich light earth, on which ſow the ſeed, but not too thick, then ſift earth over the ſeed, and cover the boxes with nets, to preſerve the ſeed from the birds.

Should the ground intended for planting be covered with ſhrubs, ſuch as Hazel, Holly, or Black Thorn, the planter ſhould make large holes between them, at about fifteen feet from each other; this to be done ſome months before planting, that the ſun and air may fertilize the ſoil; be careful that the pits are made much larger than the roots, that the young ſhoots may not be injured, but paſs readily through the looſe mould.

Let ſuch trees as are tall, be cut down cloſe to the ground, to prevent their being ſhook by the wind, which is fatal to many new plantations, and though it may appear odd to adviſe the cutting down of a tall well grown plant, yet it is neceſſary, for as the roots muſt have been much bruiſed, and much hurted by the removal, it is impoſſible for thoſe that remain to nouriſh the ſame body, which is the occaſion we ſo frequently find newly removed trees dead at top, and hide-bound, in which ſtate they never can grow to timber; but ſhould my directions be followed, ſuch ſtrong, vigorous ſhoots will ſpring up, as will in ten years become much larger trees, than if they had ſtood uncut for forty, and their bark as clean and ſappy, as if they had grown there from the ſeed, and the planter ſave much, by not being obliged to bank them, or fix their heads to ſtakes, to prevent their being ſhook. I have meaſured the firſt year's ſhoots of trees, that were cut down when planted, that exceeded four feet, but great care muſt be taken that the firſt year's ſhoots are not covered with graſs, or weeds: Oaks, Elms, Cheſnuts, Sycamores, and Aſh, thrive beſt on being cut down, but Beech not quite ſo well.

Such of the branches of ſhrubs as interfere with the young ſhoots, or ſhade them, muſt be cut away, which will greatly promote their growth. I do not find that trees grow any where ſo well as amongſt ſhrubs, or are any trees ſo clean ſkinned; this may appear extraordinary to a young planter, who may naturally think, that they will draw too much nouriſhment from the Foreſt-Trees; but the great creator of all things, has wiſely ſcattered the food of each plant over the face of the earth, ſo that many trees of different kinds will grow well on an acre of ground, when the ſame number of one kind would be ſtarved. Every gardener knows that a Peach tree will not thrive, if it is planted where an old Peach tree formerly ſtood, though a Pear or a Cherry will grow very well there.

The planter ſhould frequently viſit his plantation, and when he finds a tree dead at top, or hide-bound, he muſt cut it down as cloſe to the ground as poſſible; and where a number of ſhoots ſpring from the ſame ſtock, all ſhould be cut off but the ſtrongeſt, and the ſpare wood cut cloſe to the ſhoot. The planter ſhould not ſuffer ivy to grow round his trees, as it ſpoils their bark, and cramps them in their growth.

The leſs Foreſt-Trees are pruned the better, particularly Pines and Firs. I never ſuffered any to undergo that operation, except when the ſtem become forked; in that caſe, the beſt ſhoot was preſerved, and all others cut off cloſe to the ſtem, with ſuch ſide-branches as were too ſtrong, and drew ſo much ſap from the root as to prevent it properly expanding, for the greater encreaſe of nouriſhment to enlarge the trunk of the tree; the beſt ſoil for trees, is where the Hazel grows well. I do not depend ſo much on the richneſs of the ſoil for trees as gardeners commonly do, having obſerved moſt trees grow well in ſheltered ſituations, and even on rocks. At *Killarney*, Oaks, Aſh, Arbutus, &c. &c. grow to a great ſize, on rocks of lime and free-ſtone, where the eye can ſcarce diſcover a particle of earth; I have ſeen great numbers of the Arbutus there, that were above twenty feet high, in great beauty and vigour, growing amongſt rocks, in barren ground. A Yew, which had grown in the joint of an immenſe free ſtone, and had cleft it, meaſured in the ſtem above eleven feet round, though the top of the rock was above ſeven feet from the ground, which was a poor barren ſoil.

A Holly in *Ennisfallen* meaſured eight feet four inches round; the Yew in *Muckraſs-Abbey*, ſix feet ſix inches, and the height of the ſtem fifteen feet; a Juniper on a ſmall rocky iſland, in that delightful lake, meaſured above five feet three inches in girth.

The

The famous Arbutus at general *Cunningham's* at *Mount-Kennedy*, in the county of *Wicklow*, meaſured thirteen feet nine inches round, at one foot above the ground. I have had trees growing very well in a ſeemingly barren ſpot, which ſheltered each other, while thoſe I planted in ſingle rows, in the rich earth of an old church-yard, have failed; from hence I find that ſhelter is the principal thing to be attended to in planting; but though I am ſo great a friend to ſhelter, yet I much diſlike ſeeing trees too near each other, as their branches hurt each other, and their ſtems are drawn up to bare poles; no object of the vegetable tribe is ſo beautiful as a large branching Oak, with a fine ſtem: For this reaſon every ſpring, as ſoon as the air begins to grow warm, I direct ſuch trees that grow too near each other to be cut down, it being the proper ſeaſon for thinning plantations or woods, for trees moſt ſenſibly feel the alteration from heat to cold, and are much injured by it: many fine trees have gradually died away on their being deprived of their companions the beginning of winter, which expoſed them too much and too ſuddenly to the cold; trees properly thinned, have all the advantages of growth, and will ſoon make amends for the ſpace given them, both in reſpect of profit and beauty, while thoſe that ſtand too cloſe, (as has been obſerved,) only ſpindle to poles. The Pine and Fir, as their branches turn from the deciduous tree, ſhould from the beginning have a large ſpace given them to grow in.

Strong-rooted trees, ſuch as the Oak or Walnut, will grow well in clay, as well as the Silver-fir, and the Balm of Gilead-fir, but the Weymouth Pine, and Spruce-fir, will flouriſh beſt in a light ſoil; nay, I have ſeen them grow well in a rabbit-ſand;

but Scotch-firs are never out of place, they flouriſh in every ſoil, and in every clime, from the ſandy plains of *Heſſe-Darmſtad*, to the craggy mountains of *North Britain*; therefore, this convenient tree may be planted in our bogs or on mountains, and will form a beautiful covering for the tops of our higheſt hills: In this ſituation I doubt not, they will in time, grow to as good timber as the produce of *Norway* or *Sweden*. We are prejudiced againſt the Fir-timber of this kingdom, for what we have hitherto cut, ſoon decayed, not conſidering that even our Oak, (certainly the beſt in the world) if cut before its time, ſoon rots and decays. Our Fir-trees are uſually planted in groves, in a rich ground, where they grow faſt, are of courſe ſoft and ſpungy, and coming ſoon to a large ſize, the owners are tempted to cut them down, before they have had time to acquire any ſolidity; but were they planted in poor land, and ſuffered to ſtand to a proper age, or when cut down were ſteeped in water two or three months, or ſtoved, I doubt not, that our Fir would prove a laſting timber. This ſhould now be attended to, as Fir-timber of the northern countries is encreaſing in price every year.

I would not adviſe plantations of any of the Fir or Pine tribe, to be made of plants above four years old, for they are ſo fond of their native ſoil, as to be much checked if removed after that age. The Stone-Pine will ſcarce bear being moved, even at two years old, or having its roots touched by the knife, its ſeed therefore, ſhould be ſown in pots, out of which the roots may be eaſily taken untouched, when of an age fit to be planted out. As this tree grows on the *Alps*, in a much colder climate than ours, it ſhould be propagated here.

The Weymouth Pine grows faſt, is very ſtraight, and conſequently fit for the maſts of ſhips. I bought ſome of them from the ſeed-bed, and contrary to the general opinion, I planted ſome in a light dry ſoil, amongſt Hazel buſhes, where they remained; the others I planted in two nurſeries in walled gardens, one in a ſoil inclined to clay, well mixed with ſea-ſand, the other in a dry gravelly ſoil; of thoſe that were planted in the clay mixed with ſand, I loſt about one third, and about one fourth of thoſe that were put in the gravelly nurſery; and not one of the plants ſet amongſt the Hazels have failed; they continued much healthier, and have made better ſhoots than thoſe in the nurſeries, which were conſtantly dug about, and kept clear of weeds, when no other attention was given to thoſe planted out, than to cut down the graſs and weeds that ſtood near them, and trimming the Hazel as the young trees advanced and required air. From theſe and other obſervations, I find that the digging the earth about Pines or Firs, is very injurious to them, for however careful the labourers may be, yet they will often cut ſome of their ſide-roots, which prevents their thriving; and I am clearly of the ſame opinion in reſpect to all other Foreſt-Trees, for I find that the graſs will keep their roots cool and moiſt in ſummer, and warm in winter, and is what nature intended as a preſervative againſt the extremes of cold and heat, which is evident from trees growing ſo well in woods, and appear ſo clean barked; ſo that buſhes, graſs and weed, may be ſaid to be their protectors. As to my Foreſt-Trees, I never do more than plant them carefully, fence them well, giving them all the protection in my power, from the chilling blaſt, and then leave nature to do the reſt, and I have reaſon to think I have done well.

Sycamore will grow better in any kind of ſoil, in expoſed places, or near the ſea, than any other deciduous tree, and they are every day becoming more valuable, as our linen manufacture extends.

The Larix grows faſt in light ground, and even on a mountain, its timber is excellent for houſe-building, as it will not ſoon take fire or blaze.

Engliſh Elms are ſo eaſily thrown down by high winds, that I am not very fond of planting them, except in the face of ditches along with the quicks, and they muſt be cut down at planting; but if they are grafted, or budded on the Iriſh Elm, they will withſtand the force of any ſtorm.

Cheſnut Trees for bearing fruit, ſhould be grafted or budded.

Moſt kinds of trees and ſhrubs will grow from cuttings, if they are planted in ſheltered ſituations, at a proper ſeaſon; cuttings of tender plants, ſhould be ſet in a ſtove, or covered with bell-glaſſes, ſo that the air may not get at them for ſix weeks, or until they have put out roots.

The admirers of tender foreign plants, ſhould have hot houſes on purpoſe for them, but not amongſt their Pine plants, or Melons: for as many of them are poiſonous, it is impoſſible to determine how far the farina of their bloſſoms may affect the Pine-Apples or Melons that are near them. It is well known that the farina of Cucumbers, will ſpoil the flavour of Melons that grow near them. Gardeners ſhould therefore be careful what trees or plants they ſet amongſt fruit-trees, or plants for the kitchen uſe.

Trees that bear bad fruit, ſhould not be ſuffered to grow amongſt thoſe that bear good.

Though the Arbutus and Myrtle, as well as ſome other tender plants, grow very well in this kingdom near the ſea, yet they do not thrive ſo well in the inland parts; therefore, let the heads of theſe plants be watered with ſalt and water, on the firſt appearance of a froſt. I recommend the ſame practice to be obſerved, when your trees are infected with inſects, as I have found it equally ſucceſsful.

Should the ground you intend to plant, be covered with ſhrubs of the aquatic tribe, ſuch as Sallows, Bog-myrtle, &c. be aſſured that ſprings, or ſtanding waters have chilled it; therefore, let deep drains be made to intercept the ſprings, to carry off the water before you begin to plant any trees of value; but ſhould it not be worth the expence to accompliſh it, make your ſallow-beds there, which will turn to good account; of all the ſallow tribe, the Cheſnut ſallow, or Scented Willow is the beſt for baſket work, or for hoops, as it produces the tougheſt twig of any of the Sallows.

The red Sallow, and the Gorgomel, are the beſt for timber, or for ſheltering plantations, as they grow faſt; and here I muſt recommend the propagating of them for their bark, as we are obliged to import a great quantity every year; and we have immenſe tracts of bottoms that are now of little uſe, that might be made very profitable at a ſmall expence, by putting down in ſpring cuttings of thoſe Sallows.

The black Poplar, or *Cheſhire* Willow, is of a quick growth, and will grow very well from cuttings;

the *Carolina* Poplar and Pine-Poplar, may be grafted or budded on the young ſhoots. I have been informed that the timber of Poplars and Sallows, is very fit for making broad wheels for carts or cars, as it will hold the nails well, and is light.

Oaks will grow well in a ſwampy ſoil. I have ſeen many thrive well, notwithſtanding they were covered every winter, by the overflowing of a neighbouring river, but their timber is not ſo good as that growing on a dry ſoil.

Graſs-grounds, that are intended for plantations, ſhould be fallowed, and trench-ploughed as deep as poſſible, when this is done, the ploughman is to go as deep as he can with his plough, another is immediately to follow, and to cut as deep as poſſible in the ſame furrow, but with an higher earth-board, to caſt the earth over, and bury the ſod; which as ſoon as rotted, the ground muſt be ploughed again; for the deeper, the finer, and the looſer the earth is made, the better, the young plants will ſpread their roots in it.

Stiff clay muſt be mixed with ſand, or limed to open and warm it.

Should the ground that is intended to be planted, have been under corn the laſt ſeaſon, nothing more is neceſſary to be done, than to trench-plough it as ſoon as the corn is off, when it may be planted, for the ſtubble will open the ſoil and keep the roots warm. I would plant the ground thus prepared, with Oaks of three or four year old, at about twenty feet from each other, and all others between the Oaks, but not in ſtraight lines, as that form draws the wind too much, and would chill the young trees; the deciduous trees muſt be cut cloſe to the ground; the moſt expoſed trees of this plantation, ſhould be Sycamores and Scotch-firs, as they grow faſt, and will ſoon ſhelter the others. Hazel-nuts, Broom-ſeed and Liburnam, may be ſown through the plantation in ſpring, and Junipers, Holly and Laurels, planted there for under-wood, and covering for game.

The Autumn is the beſt ſeaſon for planting trees, and that as ſoon as their leaves begin to turn; for we in general have ſo much dry weather in ſpring, that it would be impoſſible to preſerve them by watering.

The beſt method to be followed, for planting trees in bogs, is with a ſetting ſtick, nicked at the end, for the root to lie in; the planter muſt be careful to preſs the bog well round their roots.

Not any thing more neceſſary for an orchard than ſhelter, as well as to all the different works of Nature, even the human ſpecies frequently experience its foſtering influence, and are experimentally taught its value, in this uncertain climate. To bring an orchard as early as poſſible into profit, plant Crabs or Wildings, of four or five years old, to be cut down as ſoon as planted, and on their young ſhoots graft or inoculate the beſt fruit you can procure; from this practice you will have more fruit in ten years, than otherwiſe in twenty. The Wilding, ſo neceſſary for the Cyder maker, if grafted on its own ſtock, will likewiſe come much earlier into bearing, and the fruit much improved for uſe and ſize.

Notwithſtanding the act of the 5th of George the third, gives great encouragement to planters, yet I fear this kingdom will never be well-wooded, or improved, whilſt our Roman Catholicks are precluded from taking land for their lives; ſurely this is bad policy, for their being poſſeſſed of a permanent property, would be the beſt ſecurity to government for their good behaviour, as they would then have ſomething to loſe, but the contrary in the preſent policy. The man who is ſo happy, as to have his farm and improvements ſecured for life, will exert himſelf to improve them; but the wretched tenant who knows not the hour he may be diſpoſſeſſed will not improve, leſt his labour ſhould be for the advantage of another. He never feels the joy of being at home! Which is a happineſs I ſincerely wiſh to every Iriſhman, whether he prays to his creator in Engliſh or Latin.

Such as have a deſire of putting into practice, what has been ſtrongly recommended by the late writers on planting of timber trees, are to obſerve, that the proper ſeaſon of cutting down the *Oak*, *Elm*, *Cheſnut*, *Sycamore* and *Aſh*, and others, as particularly recommended in this treatiſe, is, in the month of *February*. The progreſs that trees have made after this operation, are known to be ſuch as far exceed any other, as a firſt year's ſhoot has been found to exceed four feet, with every appearance of health and vigour; the ſhoot made is to be attended to, to remove any obſtruction of weeds or graſs, while coming up; trees that are ſtunted in their growth or ſpindle too much, as well as thoſe that are hide bound, or require their roots to be encreaſed, for the better proportioning their ſtem, or to give them a ſufficient hold in the earth, to withſtand tempeſtuous winds, are recommended to be treated in this manner. For particulars the treatiſe is requeſted to be conſulted, as this practice is not univerſally, tho' generally recommended.

CHAPTER XXXIX.

ON GRAFTING AND INOCULATION.

OF all the aids Nature has received from Art in the productions of the vegetable world, none has perhaps been more aſtoniſhingly great and uſeful to mankind in the improvement of gardening, than what has been derived from the culture of trees and the improvement of generous fruits, by grafting and inoculation. By this happy diſcovery, we can not only preſerve every ſpecies bountifully beſtowed on us by the great Author of Nature, but improve them, which by ſloth and inattention, if not loſt, would ſo degenerate as not to be worth preſerving. Thoſe that we raiſe from ſeed, we have the ſame opportunity of improving by theſe helps.

I ſhall therefore mention the different ways of grafting that are or have been uſually practiſed, as, each may be uſeful in certain circumſtances, and it is incumbent on me to point out and direct the different operations. But before we proceed to execute, let us be provided with the neceſſary materials, which are as follow:

The grafts of all hardy trees ſhould be cut three or four weeks, and laid in a ſhady border ſix or eight inches deep, before they are uſed: Such, as the gardeners call thirſty grafts, are ever found to unite ſooner, and more certainly, than when the circulation of the ſap is equally briſk in both the graft and ſtock; and I never had more ſucceſs, than with grafts that were ſo much ſhrivelled in the bark, and ſeemingly withered, as to be thought only fit for the fire by ſuch as were unſkilled in the art.

Where your ſtocks are ſtrong, that is, not leſs than half an inch in diameter, a ſtout ſtumpy graft with thick-ſet plump buds, is more to be preferred to a ſlender one, for the luxuriant growth of all hardy Foreſt-trees; but where bloſſoms and fruit are ſoon deſired, or the tree intended for a dwarf, the reverſe muſt be obſerved.

The grafts being cut and made ready, their covering ought next to be prepared, by collecting a neceſſary quantity of ſtrong, fat, loamy clay, to which add a fifth or ſixth part of new-made horſe-dung, mixed with ſome hay or ſtraw cut very ſmall, which will bind the whole well together, and prevent its rending and falling from the trees. Theſe materials muſt be well blended, by often beating, and pouring water on them every ſecond or third day, till they become ſolid and well incorporated; after this the whole ſhould be hollowed in form of a diſh, not expoſed to froſt or drying winds, but kept moiſt by regularly pouring water on it until it is uſed.

The inſtruments neceſſary for the different operations are:

1. A ſmall hand-ſaw, to cut off the heads of large ſtocks.

2. A good ſtrong pruning-knife, with a thick back, to make clefts in the ſtocks.

3. A ſmall knife, made very ſharp, to cut the grafts.

4. A grafting-chiſel, and ſmall mallet.

5. A wedge, to keep open the clefts in large ſtocks until the inſertion of the graft.

6. Some baſs mat, or woollen yarn, cut into proper lengths to tye the grafts to the ſtocks.

Since the firſt invention of grafting, there has been many various ways recommended for performing it; but the following has been found the beſt, and moſt ſucceſsful:

1. Grafting in the rind, or Shoulder-grafting, which is only proper for trees two inches diameter or upwards.

2. Cleft or Slit-grafting: This is proper for ſtocks from about three quarters of an inch to two inches diameter.

3. Whip or Tongue-grafting: This, for ſtocks not exceeding three quarters of an inch diameter, is moſt readily performed, and by far exceeds moſt of the other methods. By whip-grafting, the wounded ſtock ſoon heals, and where the growth is vigorous, in two years the ſtock and graft be-

come ſo perfectly united, that one will hardly diſcover that any inciſion had ever been made.

4. Grafting by approach, inarching, or ablactation: This is to be performed on plants in pots, or when the ſtock you would graft on, and the tree from which you take your graft ſtands, or can be brought ſo near together that they may be joined: But inarching is only proper for tender exotic plants, as from this operation they never become vigorous hardy trees, though, to bring forward the ſudden production of flowers and fruit, no practice has yet been found ſo ſucceſsful; and you may even inarch trees with the bloſſoms and fruit upon them, but this is committing violence, for it is better to allow an intimate conjunction, by a free circulation of the ſap, before you admit of their bearing any quantity of fruit at leaſt, which conſiderably impairs the ſtrength of all new-planted or new-grafted trees. This method of grafting is to be performed three or four weeks later than any of the others, and when the juices are in high circulation.

5. Grafting in the root: This is of much later invention than any of the former, and, in many circumſtances, may be an improvement on them all. It is performed by cutting the clean ſmooth roots of the ſtocks in pieces five or ſix inches long, and as large, or a little larger, than the graft of the ſpecies you are to unite: Let them be whip-grafted and tyed together very cloſe, ſo as to prevent the wet from affecting the wounded parts, and plant them ſo deep, that the graft, which ſhould be four or five inches long, may be about one half buried under the ſurface. This is an admirable practice, both for improving the fla-

vour of fruits, and preſerving a nearer ſimilitude to the tree from whence you take your grafts; for by this method the grafts will root, and theſe roots increaſe as well as thoſe from the ſtock; and as all plants draw much from the ſtock on which they are grafted, theſe will have a leſs dependence, having a great part of their nouriſhment from their own proper roots. From this circumſtance I muſt obſerve, that I can ſee no manner of difficulty in making the grafts as genuine a ſpecies as the original tree from which they were taken, by cutting away the ſtock, as ſoon as the grafts have ſtood two or three years, in which time they will have ſufficiently rooted to admit of a ſeparation, and ſucceed by themſelves. This hint may aſſuredly be improved to much advantage, and is only making the ſtock a temporary nurſe until the graft has acquired ſtrength. Where this method is to be put in practice, the grafts may be an inch or two longer than thoſe already directed, as, by giving them that additional depth in the earth, they will the ſooner and the more abundantly root.

The ſeaſon for grafting muſt be regulated according to the ſtate of the weather in the ſpring, earlier or later as that ſhall be more or leſs proper. The uſual time of performing it, is when the buds begin to ſwell, which no doubt appears very conſiſtent; but as at this ſeaſon we ſeldom have a continuance of mild weather for ſeveral weeks, I have in my earlier days often paid very dearly for my compliance with this common and ſeemingly proper time for the operation, both from a continuance of cold rains, and ſharp withering froſts, and that even after the grafts have begun to puſh out their ſhoots with ſome vigour, hence I have frequently had whole quarters cut off: Therefore,

from

from as much practice in grafting as perhaps any one man of my age has had, I adviſe, that the grafts, particularly of hardy free-ſhooting trees, be cut and laid in the ground before their buds begin to ſwell; and adviſe the operation to be delayed until the circulation of the ſap is briſk in the ſtocks, and their buds begin to break into leaves, when the grafts will immediately unite, which if done earlier, would not be the caſe; for being now advanced in the ſeaſon, we have a greater aſſurance of a continuance of milder weather. It muſt be obſerved, that the ſhoots of tender trees will not admit of being ſo long cut before they are made uſe of, as the more hardy.

Let it ever be a ſtanding rule, not to graft while it freezes or rains; in either of which events, no reaſonable ſucceſs can be expected.

It has lately become a practice, as ſoon as the grafts are tied with baſs, and without any application of the clay, to hoe up the earth ſo deep as to cover the ſtock; in this way, I have ſucceeded with hardy trees, in a dry mild ſpring: But in this country we have of late years been ſo little acquainted with theſe temperate ſeaſons, and I have ſuffered ſo much by a too ſanguine hope of better weather, that until I find ſome alteration in our climate, I ſhall neither adviſe others, nor venture myſelf, to do any thing in this way without taking every precaution, but when hands ſufficient to accompliſh the buſineſs ſeaſonably cannot be had. I recommend, that your grafts be tied as firm as may be, without galling them, that the wounded part of the ſtock be intirely covered with the baſs, and that the clay when well tempered, be put on ſmooth and cloſe, fully covering the baſs, and top of the ſtock, in ſuch a manner as will beſt keep out the air, and prevent all other injurious effects to be apprehended from cold and wet.

Inoculation or budding, is a ſpecies of grafting infinitely ſuperior to any other yet invented for moſt kinds of trees, and will ſucceed with many ſorts that will not agree, or make good plants, by any other method. From this practice of only opening about an inch of the bark, and gently thruſting in a ſmall bud between that and the wood, there is not the ſmalleſt violence committed on the ſtock, which, being done in the growing ſeaſon, in two or three weeks becomes perfectly ſound.

This operation is commonly performed from the middle of June until the middle of Auguſt, a little ſooner or later as the ſeaſon is more or leſs forward: But the beſt rule to be obſerved, is to begin when you find the buds fully formed at the extremity of the ſame year's ſhoots, at which time they have finiſhed their ſpring growth, and are ripe for inoculation.

In very hot dry ſummers, particularly in light thin ground, the bark of the ſtocks will not eaſily ſeparate from the wood, owing to a ſtagnation of juices: To remedy this evil, two or three weeks before the ſeaſon for budding commences, let the ſtocks be regularly watered every third or fourth evening; and if ſome are ſprinkled over the tops, from the roſe of the watering-pot, in imitation of Nature's watering, it will contribute much to invigorate them. This too may be very ſucceſsfully applied to the trees from whence the buds are to be taken ; by not knowing or attending to this, I have frequently ſeen the buds of an entire quarter periſh, and others where the ſtocks were ſo hide-bound that the bark would by no means ſeparate from the wood to receive the bud. A watering or two after the buds are ſet in, will likewiſe be of uſe.

The beſt time for budding is in cloudy weather, (though not when it actually rains) or in the evening of a warm dry day ; for ſhould it be performed in the middle of the day, the ſhoots will perſpire ſo faſt as to leave the buds deſtitute of moiſture.

Budding is preferable to every other operation for all kinds of ſtone fruit, as from the other methods of grafting, they are very apt to produce a gum in the wounded part, with which, if the plants are ever ſo little infected, they never ſhoot freely, or live long. It is likewiſe beſt for moſt of the nut-bearing trees, many of which will ſucceed in no other way, or by inarching, and which, as has been obſerved, is rather an amuſing entertainment than any real improvement.

The manner of performing the different operations of grafting, has been already ſo well deſcribed in books on Gardening, as to render it unneceſſary for my giving a particular detail of the different ways of doing them, and the more ſo, as they are moſt accurately and diſtinctly given in Sir James Juſtices's Piece on Gardening, illuſtrated with engraved repreſentations of the cuts and forms of the ſtock, the manner of preparing the cions and making the inciſions, the better to convey the manner of the execution, which will greatly aſſiſt the young practitioner.

Every gardener ſhould be early inſtructed in the theory as well as the practice, as the firſt elements of his profeſſion; for ſimple as the operations may appear, I never knew them readily and ſucceſsfully executed by any who had not begun early in life: I therefore adviſe all young and unexperienced gardeners, to apply themſelves as early to the practice as poſſible, conſulting the writers on the ſubject, as well as procuring the aſſiſtance of an able maſter.

The ſtocks on which the different kinds of trees will beſt ſucceed, and others by which their ſpecies will be improved, and their fruits meliorated, are already mentioned in the culture of the different trees.

☞ The method of grafting in the root, militates ſtrongly againſt the opinion, that fruits are refined and rendered more delicate, as well as enlarged by grafting on the ſtock; it has ever been conſidered as ſetting one tree in another, in which it extends its fibres, receiving its nouriſhment from the tree in which it is planted, after it has been refined, in paſſing through the ſeveral conduits of that ſet in the earth, from which it is fed with the coarſer food; but it muſt be obſerved, that this only reſpects Timber Trees.

CHAPTER XL.

On FORESTS and WOODS, and the moſt ſucceſsful as well as ſpeedy manner of PLANTING them.

TO plant a wood without incloſing, is not only amongſt the idleſt ways of throwing away money, but is laying up a fund of remorſe and diſcontent that will neceſſarily follow, from the devaſtations of cattle and ſheep, whoſe browſings and bitings communicate a poiſon to the trees, which nothing but cutting them below the infected part can expel. Let this then be your firſt care to perform in the moſt ſubſtantial manner, with double ditches or hedges, in one or other of the ways directed, according to the ſituation and quality of your ground.

Though the advantages are great, which the eſtates in England have over Scotland, owing to their growth of timber, yet we are certainly leſs attentive to the culture of woods than any other improvement. But as I believe the increaſe of them, particularly in the cold, barren, and leſs cultivated parts of this kingdom, will be of the utmoſt importance, remove many obſtructions, and pave the way to a general and ſucceſsful huſbandry of various kinds, I ſhall endeavour to give ſome hints, which, if attended to, will, I am certain, much forward the growth of the plantations,

ons, and procure them in many quarters where experiments have already been tried in vain, but not conducted judiciouſly, or on proper principles.

Where the ſoil is of a looſe ſandy quality, the trees muſt neceſſarily be planted in pits, as, by breaking up the whole ſurface, many of them would be blown out of the ground, and others buried by the driving of the ſand, where the ſituation is expoſed. With reſpect to ſuch ſoils as are ſufficiently compact not to be driven by the winds, however pitting in ſuch may be recommended, yet I muſt diſſent, and inſiſt ſuch ſhould be well fallowed and pulveriſed, by frequent ploughings and harrowings; grounds of a middling quality, that have been under graſs, will require a ſummer and winter's labour at leaſt; an obſtinate clay, not leſs than two.

Neither is the extraordinary expence of cultivating this ground ſo great, as might at firſt view appear without including the future advantages attending it. The pits in old, hard, uncultivated land, muſt be made three times as large as on that which is dreſſed, and ought to have a good deal of looſe earth laid in to place round the roots, otherwiſe, in wet ſeaſons, the water will ſtagnate and rot the fibres; and in a ſeaſon or two ſo obſtruct their progreſs, as to become ſtunted and hidebound, from which they ſlowly recover, and that but ſeldom until they are cut down; whereas, in the other ſituation, the pits need be made no larger than eaſily to contain the roots, as they will proceed in their growth, and ſpread their roots near the ſurface without interruption.

on. However, if planting the ground in its natural ſtate is determined on, let the pits be made the preceding ſpring, to correct and meliorate the ſourneſs and obſtinacy of the ſoil; and if you can procure a mixture of more generous mould, and of an oppoſite quality, let it be mixed, and often blended together with that taken out of the pits, as ſoon after as may be. In planting after this manner on ſtiff or wet land, be careful that the trees are not planted deeper than barely to ſupport themſelves againſt the winds, and that the pits may be dug conſiderably broader for their depth, than the uſual proportion allowed in a looſe dry ſoil.

For a century paſt, the Scotch Fir has been the common nurſe of all the better kinds of Foreſt Trees in Scotland; and he muſt be both ungrateful and ignorant, who is inſenſible of the many and great advantages this country has reaped from the general culture of this plant. Without the ſhelter of this foſtering Tree, we ſhould never have ſeen plantations of the Oak, the Elm, *&c.* in many almoſt barren, and expoſed ſituations. However deſerving of attention, the Scotch Fir may be for the purpoſe of planting, yet I muſt be allowed to mention other trees, that will anſwer the purpoſe as effectually in ten or twelve years, as they do in twenty, and that by an eaſier and cheaper method, than even the ſmall one of raiſing them.

The plants I mean to ſubſtitute in the place of Firs, are the different kinds of Poplars, and the large Maple, in Scotland commonly called the *Plane Tree*: They are of an infinitely quicker growth than the Firs, and they can be planted of a conſiderable ſize on the pooreſt lands with ſafety, and of courſe will ſooner give the advantages that are ſo neceſſary for young plantations.

I have long thought we are more alarmed than hurt, by the common apprehenſion of hard winters being ſo generally baneful to our hardy deciduous plantations, and believe that then only, the ſhelter from Firs or other plants is moſt materially uſeful. That we have ſeen two or three winters which have hurt hardy plants when young, or newly planted out, muſt be acknowledged; but the caſe is far from being common, and for one loſs of that kind, we have ſuſtained many more by the violence of the winds in the ſummer months, when the trees, pregnant with their juices, and loaded with leaves, are ſo heavy as to yield to the tempeſt, the roots at that time being an unequal balance to their bodies, hence theſe roots are often torn aſunder in the growing ſeaſon, and bleeding much, are apt to canker, and ſlowly, if ever, recover; which, in the moſt violent winter ſtorms, is ſeldomer the caſe, when the plants, being much lighter, firmer in their ſhoots, and diveſted of their leaves, leſs oppoſe themſelves to, and are more rarely conquered by the winds.

It has already been mentioned, that the trees for plantations muſt be adapted to the different ſoils on which they are planted; and this cannot be too much enforced, as it requires the greateſt attention and judgment, in order to adapt properly the various ſoils and ſituations of your intended wood or foreſt, to the plants intended to be ſet in them, in which, I am ſorry to obſerve, we have hitherto been extremely defective. Notwithſtanding what has been directed in this treatiſe on the culture of the different trees where treated of, it may not be amiſs to repeat ſome of theſe particulars, in order to render what is here directed, more readily underſtood.

I cannot help obſerving, we betray a general want of taſte in the diſpoſition of our woods, as in few of them any regard to elegance or beauty is conſidered, and which, if we did, would not add any thing to the expence. Why then may not all our plantations be diverſified with walks, as various as thoſe in our moſt adorned wilderneſſes? This, though not ſo ſprightly and chearful a ſcene, would be a no leſs magnificent one than the other, and as agreeable to many rural taſtes: At the ſame time, I ſhould be aſhamed to appear inſenſible of the pleaſure reſulting from a well-planted wilderneſs kept in fine order, and decked with its charming variety of hues. The free circulation of air in theſe walks and alleys would be communicated through the different quarters, render them more healthful and vigorous, and prevent many mortal diſeaſes incident to large and crowded plantations, by a ſuppreſſion of the damp vapours, which creates a mouldineſs hurtful to the plants, and contaminates the air itſelf: Beſides, were theſe walks, well ploughed, fallowed, and laid thin, would, from the great quantity of leaves they would be covered with, ſoon produce good graſs.

The beſt ſeaſon for planting the light grounds, is as ſoon as poſſible after the beginning of October; for the moiſt and heavy, in February and

March. At theſe periods, your ground being previouſly prepared in one or other of the ways mentioned, and ſtaked out in the figure you chuſe, proceed to plant as follows:

If the ground is to be laid out in the wilderneſs way, let every quarter be bounded by a row of Poplars, at two, or two and a half feet aſunder; in the heavieſt and wetteſt places, let them be of the Lombard kind, and in the thinner and lighter, of the white, which, of all the ſpecies, will make the quickeſt progreſs in ſuch ſoils; and, in order to make them yield a ſpeedier ſhelter, by growing cloſe, let them be pruned or clipped in the ſides for two or three years. Theſe Poplars ought to be planted, either rooted, or from cuttings four or five feet high, if ſuch can be conveniently procured, or as near that ſize as you can. If the whole ground is to be planted, without being divided by walks, after going round it as mentioned for the quarters, let lines of Poplars, running from ſouth to north, be planted at about an hundred, or, in very cold expoſed ſituations, at eighty feet aſunder.

The next thing to be attended to, is that the diſpoſition of the Maples be ſuch as will beſt promote the growth of the more valuable trees; for this purpoſe, I think every ſecond line ought to be of them, not next the Poplars, which will ſufficiently ſhelter whatever is immediately near them, but amongſt the trees intended for timber.

The diſtance of the trees over the whole plantation, (the bounding and dividing lines of Poplars excepted), I think, ought to be five feet every way; for whatever the advocates for very cloſe planting may advance, the conſequences ariſing from it, are generally more fatal, than erring in the oppoſite extreme. Plants may be too much crowded, or, what the gardeners call *drawn*, as well as too much expoſed; the latter evil is provided againſt by the ſhelter of the Maple and Poplar trees, with that they mutually communicate to each other.

Having planted one half of your intended Foreſt, (free from ſtanding water,) with Maples, in rows ten feet aſunder, and five in the row, conſult the nature of every ſpot in it, that the more valuable plants may be diſpoſed of in the ſoils they moſt delight, which, in general, I take it to be as follows:

In the moſt generous, deep, but dry ſoils, the Walnut, with Engliſh, Scots, and Corniſh Elms; in the moiſt and heavy, the Dutch Elm; in coarſe and ſtoney, the Cheſnut and Aſh; in light and ſandy, the Larch and Beech; and in clays of all the different qualities, tho' ſwampy and moſſy, the Oak. Theſe are the ſoils moſt univerſally prevailing in Great Britain, and thoſe the trees nature ſeems beſt to have fitted for them. They are alſo of the greateſt value, and moſt general uſe, tho', if a little ornament and variety is wanted, a ſmall mixture of the hardy American ſorts may be added; but profitable returns being the principal object of this Eſſay, to that I chuſe, in a great meaſure, to confine myſelf.

Where the ſoils are very different, and the trees adapted to that variety, an extenſive plantation, diverſified with groups in different quarters, will appear far more chearful and pictureſque, than one uniform wood of the ſame kind of trees.

A Foreſt, planted in the manner I have here deſcribed, ſhould be of a continued flat, at leaſt one not broken with rocks, for which reaſon, I have been altogether ſilent in reſpect of the Scotch Fir; but in mountainous rocky ſituations, the Poplar and Maple will not ſucceed, for want of a ſufficient depth of earth to cover their roots at firſt planting: In ſuch places, perhaps the Firs are the greateſt improvement that can be made, planted not above three years old, when, after two years more growth, Oaks and other trees may be interſperſed wherever the land will receive them. The culture of the Scotch Fir then, ſo far from being diſcountenanced, ſhould, with the greateſt propriety, be rather increaſed; as there are ſtill, in moſt parts of Great Britain, more large tracts of mountainous, poor, and otherwiſe yet unimproved ſurface, than the greateſt induſtry of ſeveral ages will probably overtake, which may be covered with theſe plants. But I ſhall now proceed to the ages and ſizes of trees beſt fitted, in forbidding ſoils and ſituations, to make our Foreſt flouriſh.

Some have aſſerted, that the beſt manner of rearing woods, is by ſowing the ſeed on the ſpot. But of this I cannot approve, for ſeveral reaſons: For beſides the great expence, length of attention, that is required before the plants can be left to nature, the ground muſt be as well prepared, kept as clear of weeds, the land about the plants as regularly dug, and in all reſpects as well cultivated as the nurſery. It is but a ſmall proportion of the plants produced from the ſeed, that can remain in the wood to become trees, while the ſuperabundant, which muſt be taken away, have injured thoſe that remain, and makes much againſt this practice.

I am therefore againſt raiſing a Foreſt, after this manner, except with the Walnut, Cheſnut, Evergreen Oak, and a few of the other nut-bearing trees, that do not eaſily remove, or grow freely after it, and even of thoſe only where timber, without any regard to fruit, is the object; in this caſe, ſuch are preferable to the beſt cultivated plants, where the land is not extremely bad.

Moſt gardeners are for planting ſeedlings of two years old, as the moſt hardy, and likely to ſucceed, in our barren, cold, uncultivated ſoils. This practice, however univerſal, and long ſanctified by cuſtom, has no weight with me, as, from many trials, I have found it abſurd; and I cannot help declaring, I think it both againſt nature and common ſenſe, nor can I in any other way account either for its beginning or continuance, than the bad culture too generally given to our trees in the nurſery, after they have been removed from the ſeed-bed, as they are dibbled in without a proper reduction of their roots, ſo as to encreaſe and properly extend them, and are generally crowded ſo thick together, as ſoon to become much worſe than good ſeedlings, having hard carroty roots, without fibres to feed them, and tall ſlender bodies, unable to bear a gentle guſt of wind.

I preſume no experienced gardener will deny, that ſeedling trees in general have one downright top-root, with few ſmall roots or fibres, in compariſon of ſuch as have been tranſplanted, and their roots ſhortened, and repeated at proper periods; this will not only increaſe the roots, but render them hardy, by change of food and ſituation. As this is the caſe, it appears to me ridiculous to aſſert, that a young tender plant, juſt taken from a warm ſeed-bed, is ſufficiently hardy to bear being expoſed to a bleak ſituation, and a cold uncultivated ſoil; it may with equal juſtice be ſaid, that an infant from the breaſt ſhould be able to bear the inclemency of the ſeaſons, and live and thrive with coarſer food, and leſs ſhelter, than a child that has been properly nouriſhed for ſome conſiderable time, and inured by degrees to a variety of changes.

The analogy between the animal and vegetable creation, which in many circumſtances greatly reſemble, confirm what I have aſſerted, nor is what I have advanced a ſpeculative notion; but to exemplify it, I ſhall mention the following experiments, and which I have repeatedly made:

I have ſown the ſeeds of Foreſt Trees on the pooreſt ground, planted ſeedlings, and ſtrong well-nurſed trees, from ten to five feet high, on the ſame ground, when the old cultivated plants have frequently made ſightly trees, the ſeedlings have periſhed, and, from the ſterility and coldneſs of the ſoil, the ſeed has not ſo much as vegetated. In ſhort, the mouths of ſeedlings are not ſo well fitted as larger plants, to draw nouriſhment from crude, rank, and uncultivated ſoils; and, as I have repeatedly found in many inſtances, what is here ſaid to be the caſe, I am obliged to believe, that the general practice of planting ſeedlings in poor, and larger trees in good land, ſhould be reverſed; but ſtill attending to this moſt eſſential and indiſpenſible circumſtance, that the large plants have been removed as directed, and otherwiſe properly cultivated.

Having then planted your well reared trees, and rejected both the ſowing of ſeed, and planting of ſeedlings in your wood; I would adviſe their being four or five years old, that is, to have been removed at the proper times already mentioned from the ſeed-bed, and cultivated in the nurſery two or three years, more or leſs according to their kinds, and the quality of the ground whereon they are to ſtand; with ſuch finiſh your plantation, in the manner, and at the diſtances directed for the Maples. Thoſe trees will be able to get the better of all weeds, but a few of the large-growing ſorts; and the land may be cultivated by hoeing in ſummer, and digging in the autumn and ſpring months, or not, yet ſhould this be continued for three or four years, with the neceſſary care, that is, of not injuring the horizontal fibres that approach the ſurface, when the more vigorous growth of the trees will ſoon amply repay the expence.

When theſe plants have ſtood four years, but not longer, take away every ſecond Plane, and, in two years more, the remainder of them, with every ſecond tree of the other kinds, which will leave the whole plantation at ten feet aſunder.

The trees raiſed cannot be loſt to a perſon who has any conſiderable extent of land, few large Britiſh eſtates being yet too much crowded with wood over all parts of them. They may be planted on the farms in hedge-rows, and many various ways to great advantage, and would coſt a great deal of money from a nurſeryman; ſo that the expence of this plantation ought not to be grudged, having effected two of the moſt capital points on any eſtate, a thriving wood, and a good nurſery.

From this time theſe plants will require no further trouble, than pruning away the ill-placed ſuperfluous branches, until they bring money, which they ought to do in eighteen or twenty years from planting, at which time three-fourths more of the remaining trees, and all the Poplars, muſt be taken away, which reduces them to twenty feet aſunder, and when the value of the timber, cut for country uſes, will certainly exceed both the expence of labour and rent of the ground, much more than any other crop will; beſides, the trees, at theſe diſtances will not hereafter prevent the ground from yielding good paſture, and the value of the plantation, for fifty years afterwards, will annually increaſe in greater proportion than before.

Though I have mentioned the whole trees in this Foreſt to be planted the ſame ſeaſon, yet if the nurſing ones, which are ſoon to be taken away, were planted a year or two before the others,

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particularly in very bad ſoils, and expoſed ſituations, it would, in place of loſing, be gaining time, as, from their immediate and extraordinary ſhelter, the better trees would have little check from the winds the firſt ſeaſon, which when they meet with in a violent degree, often keeps them at a ſtand for ſeveral years. It is therefore of the greateſt conſequence, that every poſſible aſſiſtance be given them, to encourage a free growth at being firſt planted out.

Notwithſtanding of warmly recommending ſhelter at firſt planting, as the moſt probable means of ſooneſt procuring a flouriſhing plantation, yet I muſt no leſs recommend attention in taking away the neceſſary proportions, where too thick, ſeaſonably as they advance; from which neglect, I have often ſeen many extenſive plantations of noble Oaks ruined, by being overhung with Scots Firs, which not admitting a free circulation of air, they have been drawn up to the moſt diſproportioned heights, and this misfortune nothing but cutting down will effectually cure; but the different periods here directed for thinning them, will generally anſwer your intentions.

From the late and now univerſal taſte in all new and expenſive deſigns in the garden way, of throwing a large extent of ground about the houſe into lawns of graſs, many fruit-trees, which in former times generally grew in the kitchen garden, and theſe gardens adjoining to the houſe, are now deſtroyed, from whence common fruit has riſen in price to the full proportion of every other article in life. I cannot therefore but believe, that an orchard, which, ſenſibly planted, will little or not at all impede the growth of graſs, corn, and other vegetables, would ſoon become the higheſt improvement the lands in this country are capable of receiving: But a diſſertation on Fruit-trees being foreign to the preſent ſubject, I only mention, that if ſome of the moſt favourable quarters for fruit were incloſed, and planted with ſtrong well-cultivated trees of them, in fourteen or ſixteen years, every tenth acre of the orchard would certainly pay the whole expence laid out in our Foreſt, and lay the foundation, without further expence, of an eſtate, increaſing conſiderably for ages. Apples and Pears, the moſt certain and profitable ſtandard fruits, will ſucceed in land of any tolerable depth, though coarſe and heavy, having been expoſed and meliorated by the winter's froſt and ſummer's ſun.

CHAPTER XLI.

On making TREES FIT FOR REMOVAL, that have ſtood uncultivated and too thick in Nurſeries or Woods.

THOUGH the longeſt experience, and moſt extenſive knowledge in planting, will not for many years, if ever, bring overgrown unremoved trees to the comely figure and luxuriant growth of thoſe that have been reared from young plants, according to the preceding directions, yet, where one cannot procure ſuch, and have of the former, they may turn them to account, and ſoon make a figure in a bare field, or about a new-built houſe.

The trees worthy of this labour ought not to exceed fourteen or ſixteen years growth, or from twenty to twenty-five feet high, as, if older, in general the cutting of either their roots or bodies will be doing them a violence they will never recover ſo perfectly as to become handſome trees, but ever continue in a ſpreading buſhy form.

The ſorts to be treated in this manner, are the different ſpecies of Elms, of which the Engliſh, as the moſt aſpiring, and that ſooneſt recovers its wounds, is far the moſt proper. The Lime will bear this operation at a great ſize, ſoon heal, and afterwards may be formed with eaſe to any ſhape you pleaſe: The Aſh and Oak will likewiſe admit of cutting well enough at the ages mentioned, but theſe ought to be cut higher in proportion to their bulk than the former, and where the bark is ſmoother and thinner; from whence the ſhoots will be fewer, and riſe in a more perpendicular direction. In this direction, and in the ſtrength of the branches, they will be much aſſiſted, by rubbing off all the tender ſhoots, but one or two of the moſt erect and vigorous, from the beginning till the end of June.

The Beech, the Platanus, the large-leaved Maple, the Hornbeam, the Sweet Cheſnut, the Horſe Cheſnut, the Poplar, and the Laburnum, will alſo bear being reduced in height, but will not afterwards grow lofty, or in the pyramidal form, but, in detached trees, on lawns, or other graſing fields, may make graceful ſpreading plants, and afford an agreeable ſalutary retreat for men or cattle from the ſcorching ſummer heats.

The firſt ſtep to be taken in this buſineſs, is, to mark out what trees (if any) you intend ſhould remain on the ſpot, as alſo thoſe you mean to remove for planting again, leaving them at ſuch diſtances, as that there may be ſufficient bounds for making a deep trench round each plant for undermining them the following ſeaſon. This being done, in autumn grub out by the roots all the others, and trench the ground at leaſt three feet deep, of whatever quality it be, which will encourage many ſpreading roots from the ſides, and better prepare them for what is to enſue. Early in the ſucceeding ſpring, cut your trees over at a ſuitable height, a good deal ſlanting, immediately above where buds are, or branches have been, and rub over the wound with pitch, or cover it with a plaiſter of clay mixed with horſe-dung, ſuch as has been directed for grafts. It is impoſſible juſtly to aſcertain the height theſe trees ſhould be reduced to, that depending on their proportions, as the ſtrong-bodied plants muſt be cut higher than the more ſlender of the ſame height. I ſhall ſuppoſe them, from ſtanding very thick, to be drawn the length of twenty-five feet; in that event, cutting them from twelve to fifteen feet high may probably be about a proper medium, but the preciſe ſtandard muſt depend on ſome little knowledge in the operator, or rather director, as indeed the wounding or pruning of trees of every kind, and for every particular purpoſe, ought not to be left to the barbarity of common labourers, but have more attention beſtowed, and gentler treatment given them, than they uſually meet with.

The general practice in caſes of this kind, is reducing both the tops and roots of the tree at the ſame time: But this is a ſeverity they will not bear; for though they may outlive it a few years, it will be but in a conſumptive way, from which they never fully recover: Therefore, to do this effectually, two years more muſt at leaſt be employed.

The following ſpring then, make a trench between three and four feet deep, and full four feet wide, round all the plants to be removed: Bend the tree ſo far to one ſide, as that you can come eaſily at the downright roots; after which, with a ſharp hatchet, cut them acroſs, but leave the ſide-roots, particularly thoſe neareſt the ſurface, as little diſturbed as may be: This being done, replace the plant in its former upright ſtation, and throw back the earth taken from about it.

A year after, open the ſame trench, and ſhorten all the ſpreading ſide-roots, which will much increaſe their number, and make the earth adhere to them when the trees are raiſed for good, and which they may be the ſucceeding ſeaſon, but it will ſtill be better if they remain another. It may naturally occur, that if any of the trees are to remain, reducing their overgrown heights is all that is neceſſary to be done with them.

The reaſon of taking two or three ſeaſons for preparing theſe roots in the manner directed, is, that the ſtrength of the trees may be as little impaired as poſſible, particularly ſuch as you intend to grow lofty in the pyramidal form, which, when all the wounding operations are performed at once, they cannot do, as the ſhoots, from weakneſs, will not grow perpendicular, but looſe and ſtraggling, though, by uſing theſe precautions, and having this patience, which in the main is loſing no time, the upright ſhoots will be ſtraight and vigorous before the trees are raiſed, and, being furniſhed with plenty of young freſh roots, they will riſe with bulks of earth about them, and continue in a healthful ſtate.

For the beſt manner of planting theſe trees, ſee the ELM.

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15 SEP 62